

Superfund Records Center
SITE: Sutton Brook
BREAK: 1-2
OTHER: 32952

Soil Gas Analysis Results

REGION I
Data Review Worksheets

Site Name Poole Landfill
Reference Number _____

REGION I REVIEW OF ORGANIC CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) Ross Analytical data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. work order 95-07-038 DAS No. NA Sampling Date(s) 6/30/95
SDG No. _____ Matrix Air Shipping Date(s) 6/30/95
No. of Samples 4 + TB Date Rec'd by Lab 7/1/95

Traffic Report Nos: TB-4; LFG-1; LFG-2; LFG-3; LFG-4

Trip Blank No.: TB-4

Equipment Blank No.: NA

Field Duplicate Nos: LFG-3 and LFG-4

SOW No. _____ requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- | | |
|-----------------------|--------------------------------------|
| -Data Completeness | -Matrix Spike/Matrix Spike Duplicate |
| -Holding Times | -Field Duplicates |
| -GC/MS Tuning | -Internal Standard Performance |
| -Calibrations | -Pesticide Inst. Performance |
| -Blanks | -Compound Identification |
| -Surrogate Recoveries | -Compound Quantitation |

Overall comments: _____

Definitions and Qualifiers:

- A - Acceptable data.
- J - Approximate data due to quality control criteria.
- R - Reject data due to quality control criteria.
- U - Compound not detected.

Reviewer: Sharon Hoppe Date: 6/10/95

REGION I

Data Review Worksheets

I. DATA COMPLETENESS

MISSING INFORMATION

DATE LAB CONTACTED

DATE RECEIVED

REGION I
Data Review Worksheets

II. HOLDING TIMES

Complete table for all samples and circle the fractions which are not within criteria.

TB-14P TB-14 NP

SAMPLE ID	DATE SAMPLED	VOA DATE ANAL.	BNA DATE EXTRACT	BNA DATE ANAL.	PEST. DATE EXTRACT	PEST. DATE ANAL.
TB-4	6/30/96	7/14	7/10 NA	NA	NA	NA
LFG-1		7/14	7/10			
LFG-2		7/14	7/12			
LFG-3		7/14	7/10			
LFG-4		7/14	7/10			
LFG-4D _{up}	6/30/96	7/14	7/10			
TB-4DL	6/30/96	NA	7/12			
LFG-1DL	6/30/96		7/12			
LFG-1DL2	6/30/96		7/12			
LFG-2DL	6/30/96		7/12			
LFG-4DL	6/30/96		7/12			
LFG-4D _{up} DL	6/30/96	7/14	7/12			

VOA - Unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
 Preserved: Both within 14 days of sample collection.
 Soils: Both within 14 days of sample collection.
 BNA & Pesticides - Extracted within 7 days, analyzed within 40 days of extraction, both soils and waters.

- Action: 1. If holding times are exceeded, all positive results are estimated (J) and all non-detects are estimated (UJ).
 2. If holding times are grossly exceeded, the reviewer may determine that all non-detects are unusable (R).

TB-14 Holding Time = 14 days

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Data Review Worksheets

III. GC/MS TUNING

 X The BFB performance results were reviewed and found to be within the specified criteria.

If no,
Samples affected: _____

 The DFTPP performance results were reviewed and found to be within the specified criteria.

If no,
Samples affected: _____

If the ion abundance criteria is not met refer to the validation guidelines for expanded criteria. If necessary, all associated data should be qualified as rejected and unusable (R).

REGION I
Data Review Worksheets

Non Polar

IV. ORGANIC CALIBRATION VERIFICATION

Date of Initial Calibration: 7/5/95 ; 7/12/95
 Dates of Continuing Calibrations: _____
 Instrument ID: _____
 Matrix/Level: _____

DATE	CRITERIA OUT RRF, %RSD, RRF, %D	COMPOUND (VALUE)	
<u>7/5/95</u>	<u>ICAL 28.4% %RSD</u> Samples Affected:	<u>Methylene Chloride 28.4%</u>	} All Samples affected
<u>7/12/95</u>	<u>ICAL 30.2% %RSD</u> Samples Affected:	<u>Methylene Chloride 30.2%</u>	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	
_____	Samples Affected:	_____	

QC CRITERIA:

1. %RSDs must be $\pm 25\%$
2. %Ds must be $\pm 30\%$

*Validation Action. Since all results are
 qualified as non detected; no add'l
 qualification is necessary*

ACTION:

1. If RF < 0.05 , flag + results as estimated (J), non-detects as unusable (R).
2. If %RSD or %D outside of criteria, flag positive results as estimated (J).
3. If the %RSD or %D is $> 50\%$, flag non-detects as estimated (UJ)

A separate worksheet should be filled out for each initial curve.

REGION I
Data Review Worksheets

Polon

IV. ORGANIC CALIBRATION VERIFICATION

Date of Initial Calibration: 7/13/95
Dates of Continuing Calibrations: _____
Instrument ID: _____
Matrix/Level: _____

DATE	CRITERIA OUT RRF, %RSD, RRF, %D	COMPOUND (VALUE)
<u>7/13/95</u>	<u>%RSD / ICA</u> Samples Affected:	<u>Acetone</u> <u>36.6%</u>
—	<u>%RSD</u> Samples Affected:	<u>2-Butanone</u> <u>32.8%</u>
—	Samples Affected:	<u>4-Methyl-2-Pentanone</u> <u>37.2%</u>
—	Samples Affected:	<u>1,4-Dioxane</u> <u>103.5%</u>
—	Samples Affected:	<u>All compounds; all samples affected.</u>
<u>7/14/95</u>	<u>d/D</u> Samples Affected:	<u>1,4-dioxane</u>
—	Samples Affected:	<u>Tetrahydrofuran</u>
—	Samples Affected:	<u>All samples affected for all compounds</u>
—	Samples Affected:	_____
—	Samples Affected:	_____
—	Samples Affected:	_____

QC CRITERIA:

1. %RSDs must be $\pm 25\%$
2. %Ds must be $\pm 30\%$

ACTION:

1. If RF < 0.05 , flag + results as estimated (J), non-detects as unusable (R).
2. If %RSD or %D outside of criteria, flag positive results as estimated (J).
3. If the %RSD or %D is $> 50\%$, flag non-detects as estimated (UJ)

Validation actions: Acetone: Flag positive results as estimated (J)

2-Butanone - no positive results; no action
4-Methyl-2-Pentanone - ditto
1,4-Dioxane - estimate non-detects UJ.

Tetrahydrofuran estimate positive results - no action

A separate worksheet should be filled out for each initial curve.

REGION I
Data Review Worksheets

V A. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: low

	<u>Date</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration/ Units</u>
NP	7/10/95	VB LK 0710C2	Air	Methylene Chloride	c. 37 ppb
NP	7/12/95	VB LK 0712C	↓	"	0.45 ppb
P	7/14/95	VB LK 0714C		No Detect	

2. Equipment, Method and Trip Blanks

	<u>Date</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Compound</u>	<u>Concentration/ Units</u>
		TB-4		Trip Blank is not applicable if water collected using ambient air instead of ultra-pure. The trip blank is not representative of contamination acquired during titration	

A separate worksheet would be used for low and medium level blanks.

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Data Review Worksheets

V B. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 10 times the amount in the blank for common contaminants or 5 times the amount for any other compound. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).
2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).
3. If the concentration is greater than the action level, report the concentration unqualified.

Common contaminants: Methylene Chloride, Acetone, 2-Butanone, Toluene, Phthalates

LEVEL: low

<u>Compound</u>	<u>Max. Conc./Units</u>	<u>Action Level/Units</u>	<u>CRQL</u>
<u>Methylene Chloride</u>	<u>0.75 ppbv</u>	<u>7.5 ppbv</u>	<u>0.20 ppbv</u>

Results for all analyses are qualified as non-detected
"U" as they are below the action level, but above the
quantitation limit.

A separate worksheet should be used for low and medium level blanks.

REGION I
Data Review Worksheets

VI. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

Matrix: Air

Sample ID	V1	V2	V3	S1	S2	S3	S4	S5	S6	S7*	S8*	P1*	P2*
	<u>All within criteria</u>												
QC	<u>50</u>	<u>50</u>	<u>50</u>										
Limits	to	to	to	to	to	to	to	to	to	to	to	to	to
	<u>150</u>	<u>150</u>	<u>150</u>										

V1 = Toluene-d₈ ✓
V3 = 1,2-Dichloroethane-d₄ ✓
S2 = 2-Fluorophenol
S4 = Nitrobenzene-d₅
S6 = Terphenyl
S8 = 1,2-Dichlorobenzene-d₄*
P2 = Decachlorobiphenyl*
* = Limits are advisory only.

V2 = Bromofluorobenzene ✓
S1 = Phenol-d₅
S3 = 2,4,6-Tribromophenol
S5 = 2-Fluorobiphenyl
S7 = 2-Chlorophenol-d₄*
P1 = Tetrachloro-m-xylene*

% Recovery

<10% 10% to lower CRR > higher CRR

Positive Sample Results
Non-detected Results

J
R

J
UJ

J
A

CRR = Contract required recovery range as stated in the Validation Guidelines.

REGION I

Data Review Worksheets

MS/MSD Not Applicable

VII A. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

LSC Analysis
Sample Nos. LCS0712C

Matrix: Am

Replicate Analysis of LFG-4
List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

MS or MSD	Compound	%REC/ RPD	QC Limits
- All criteria met for LCS <u>LCS0712C</u>			
- All criteria (0/0D (25%)) met for Replicate Analysis of LFG			

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

- If any compound does not meet the Contract Required Recovery range (CRR) as stated in the Validation Guidelines, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	> higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UI	A

- If any compound does not meet the RPD criteria as stated in the Validation Guidelines, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

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Data Review Worksheets

Not Applicable

VII B. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (Section 2)

3. Matrix Spike/Matrix Spike Duplicate - Unspiked Compounds

Sample Nos. _____

List the concentrations of the unspiked compounds and determine the percent RSD's of the unspiked sample, matrix spike, and matrix spike duplicate. No limits have been developed for the RSD values of the unspiked compounds.

<u>Fraction</u>	<u>Compound</u>	<u>Sample, MS, MSD Conc.</u>	<u>% RSD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

The reviewer must use professional judgement to determine if there is a need to qualify any of the unspiked compounds in the sample.

REGION I
Data Review Worksheets

VIII. FIELD DUPLICATES

Sample Nos. LFG-3; LFG-4

Matrix: Air

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

<u>COMPOUND</u>	<u>SAMPLE CONC</u>	<u>DUP SAMPLE CONC</u>	<u>RPD</u>
Anthracene Ch. 1			
All criteria met			

ACTIONS:

1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated (J).
2. If one value is non-detected, and one is above the CRQL:
 - a. Flag the positive result as estimated (J).
 - b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

REGION I
Data Review Worksheets

IX. INTERNAL STANDARD PERFORMANCE

List the internal standard area counts of samples which do not meet the criteria of +100% or -50% of the internal standard area in the associated continuing calibration standard.

<u>SAMPLE ID</u>	<u>DATE</u>	<u>IS OUT</u>	<u>IS AREA/RT</u>	<u>ACCEPTABLE RANGE</u>	<u>ACTION</u>
<u>all criteria met</u>					

ACTION:

1. If an IS area count is outside the criteria -50% or +100% of the associated standard:
 - a. Qualify positive results for compounds quantitated using that IS quality as estimated (J).
 - b. Qualify non-detected results for compounds quantitated using that IS as estimated (UJ).
 - c. If extremely low area counts are reported, or if performance exhibits a major drop-off, then a severe loss of sensitivity is indicated. Non-detected results should then be qualified as unusable (R).
2. If an IS retention time varies more than 30 seconds, the chromatograms for that sample must be examined to determine if any false positive or negative results are reported. For shifts of a large magnitude, professional judgement may be used in considering partial or total rejection of the data for each associated sample.

REGION I
Data Review Worksheets

Not Applicable

XII. SAMPLE QUANTITATION

In the space below, please show a minimum of one sample calculation per fraction:

VOA:

BNA:

PEST/PCB:



Ross Analytical Services, Inc.
 16433 Foltz Industrial Parkway • Strongsville, Ohio 44136
 (216) 572-3200 • Fax (216) 572-7620 • 1-800-325-7737

CERTIFICATE OF ANALYSIS

Client:

Metcalf & Eddy
 P.O. Box 4071
 30 Harvard Mill Square
 Wakefield, MA 01880-5371
 Attn: Mr. Bruce Livingston

Work Order #: 95-07-032
 Client Code: METCALF_MASS
 Report Date: 07/17/95
 Work ID: Air Samples for TO-14
 Date Received: 07/01/95

Purchase Order: 017672-0003/ROLLO Landfill

SAMPLE IDENTIFICATION

Lab Number	Sample Description
01	Canister TB-4/#304
03	Canister LFG-2/#623
05	Canister LFG-4/#388

Lab Number	Sample Description
02	Canister LFG-1/#339
04	Canister LFG-3/#585

Data are reported on an as-received basis unless stated otherwise. Estimated Quantitation Limits (EQL's) are listed for most analytes. EQL's are the lowest concentrations that can be reliably measured under routine laboratory conditions. Unless otherwise noted, method blanks had no targets found above their EQL's and results were not corrected for blanks.

Amy E. Nasr
 Certificate approved by
 Amy E. Nasr

Post-It® Fax Note	7671	Date	7/17	# of pages	15
To	Andrew Beliveau	From	Amy Nasr		
Co./Dept.	Metcalf & Eddy	Co.	ROSS		
Phone #		Phone #			
Fax #	617 345 6293	Fax #			

Work Order # 95-07-032

Ross Analytical Services, Inc

Reported: 07/17/95

TEST METHODOLOGIES

Volatile organics were determined by aliquoting from a SUMMA-polished canister or other vessel followed by gas chromatography/mass spectrometry as in EPA Method TO-14. A single analytical run for all targets was performed, without the Nafion dryer in place.

2A
AIR VOLATILE SURROGATE RECOVERY

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	LCS0705C	97	103	100		0
02	VBLK0705C2	97	102	94		0
03	VBLK0710C2	100	102	97		0
04	LCS0710C	95	102	102		0
05	LFG-1 NP	77	103	110		0
06	LFG-3 NP	84	109	106		0
07	LFG-4 NP	85	104	110		0
08	LFG-4DUP NP	85	106	113		0
09	TB-4 NP	78	109	100		0
10	VBLK0712C	95	100	93		0
11	LCS0712C	92	101	99		0
12	LFG-1DL NP	98	100	94		0
13	LFG-4DL NP	93	96	94		0
14	LFG-4DUPDL N	91	98	91		0
15	LFG-2 NP	96	100	104		0
16	TB-4DL NP	82	102	96		0
17	LFG-1DL2 NP	91	103	96		0
18	LFG-2DL NP	90	102	99		0
19	VBLK0714C	110	105	90		0
20	TB-4 P	100	106	97		0
21	LFG-1 P	93	106	103		0
22	LFG-2 P	93	106	96		0
23	LFG-3 P	83	106	58		0
24	LFG-4P	74	84	109		0
25	LFG-4DUP P	88	105	102		0
26						
27						
28						
29						
30						

QC LIMITS

S1 (DCE) = 1,2-Dichloroethane-d4 (54-152)
 S2 (TOL) = Toluene-d8 (27-175)
 S3 (BFB) = Bromofluorobenzene (53-172)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 4.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

74-87-3	-----Chloromethane	0.77	J
74-83-9	-----Bromomethane	0.82	U
75-01-4	-----Vinyl Chloride	0.82	U
75-00-3	-----Chloroethane	0.82	U
75-09-2	-----Methylene Chloride	100	EB
75-15-0	-----Carbon Disulfide	2.0	
75-69-4	-----Trichlorofluoromethane	12	
75-35-4	-----1,1-Dichloroethene	0.82	U
156-60-5	-----trans-1,2-Dichloroethene	0.82	U
75-34-3	-----1,1-Dichloroethane	0.82	U
107-06-2	-----1,2-Dichloroethane	0.82	U
67-66-3	-----Chloroform	0.25	J
75-71-8	-----Dichlorodifluoromethane	2.4	
71-55-6	-----1,1,1-Trichloroethane	3.9	
56-23-5	-----Carbon Tetrachloride	0.82	U
75-27-4	-----Bromodichloromethane	0.82	U
78-87-5	-----1,2-Dichloropropane	0.82	U
10061-01-5	-----cis-1,3-Dichloropropene	0.82	U
79-01-6	-----Trichloroethene	0.82	U
10061-02-6	-----trans-1,3-Dichloropropene	0.82	U
79-00-5	-----1,1,2-Trichloroethane	0.82	U
75-25-2	-----Bromoform	0.82	U
79-34-5	-----1,1,2,2-Tetrachloroethane	0.82	U
127-18-4	-----Tetrachloroethene	0.82	U
108-88-3	-----Toluene	7.2	
108-90-7	-----Chlorobenzene	0.82	U
100-41-4	-----Ethylbenzene	4.1	
100-42-5	-----Styrene	0.82	U
106-42-3	-----m,p-Xylene	10	
95-47-6	-----o-Xylene	2.6	
1330-20-7	-----Xylene (total)	13	
76-13-1	-----1,1,2-Trichloro-1,2,2-triflu	1.5	
156-59-2	-----cis-1,2-Dichloroethene	0.82	U
124-48-1	-----Dibromochloromethane	0.82	U

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1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

TB-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 4.1

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

Q

106-93-4-----	1,2-Dibromoethane	0.82	U
108-67-8-----	1,3,5-Trimethylbenzene	0.53	J
95-63-6-----	1,2,4-Trimethylbenzene	1.3	
541-73-1-----	1,3-Dichlorobenzene	0.72	J
106-46-7-----	1,4-Dichlorobenzene	0.82	U
100-44-7-----	Benzyl chloride	0.82	U
95-50-1-----	1,2-Dichlorobenzene	0.82	U
120-82-1-----	1,2,4-Trichlorobenzene	0.82	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	0.82	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 4.1

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	7.733	5.2	J
2.	Unknown Alkane	8.643	9.3	J
3. 110-54-3	Hexane	12.119	35	NJ
4.	Unknown Cyclic Alkane	13.138	4.8	J
5.	Unknown Branched Alkane	14.670	4.2	J
6.	Unknown Branched Alkane	22.634	5.2	J
7. 124-18-5	Decane	23.472	7.5	NJ
8. 99-87-6	Benzene, 1-methyl-4-(1-methy	24.368	6.5	NJ
9.	Unknown Branched Alkane	24.513	4.8	J
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

VOLATILE ORGANICS ANALYSIS DATA SHEET

TB-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 40.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
---------	----------	--	---

74-87-3	Chloromethane	8.2	U
74-83-9	Bromomethane	8.2	U
75-01-4	Vinyl Chloride	8.2	U
75-00-3	Chloroethane	8.2	U
75-09-2	Methylene Chloride	140	B
75-15-0	Carbon Disulfide	2.8	J
75-69-4	Trichlorofluoromethane	190	
75-35-4	1,1-Dichloroethene	8.2	U
156-60-5	trans-1,2-Dichloroethene	8.2	U
75-34-3	1,1-Dichloroethane	8.2	U
107-06-2	1,2-Dichloroethane	8.2	U
67-66-3	Chloroform	8.2	U
75-71-8	Dichlorodifluoromethane	150	
71-55-6	1,1,1-Trichloroethane	8.2	U
56-23-5	Carbon Tetrachloride	8.2	U
75-27-4	Bromodichloromethane	8.2	U
78-87-5	1,2-Dichloropropane	8.2	U
10061-01-5	cis-1,3-Dichloropropene	8.2	U
79-01-6	Trichloroethene	8.2	U
10061-02-6	trans-1,3-Dichloropropene	8.2	U
79-00-5	1,1,2-Trichloroethane	8.2	U
75-25-2	Bromoform	8.2	U
79-34-5	1,1,2,2-Tetrachloroethane	8.2	U
127-18-4	Tetrachloroethene	8.2	U
108-88-3	Toluene	37	
108-90-7	Chlorobenzene	8.2	U
100-41-4	Ethylbenzene	24	
100-42-5	Styrene	8.2	U
106-42-3	m,p-Xylene	54	
95-47-6	o-Xylene	13	
1330-20-7	Xylene (total)	67	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	8.2	U
156-59-2	cis-1,2-Dichloroethene	1.9	J
124-48-1	Dibromochloromethane	8.2	U

JUL 17 '95 17:51 ROSS ANALYTICAL SERVICES, INC.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. ^{P.B.}

TB-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 40.8

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	8.2	U
108-67-8-----	1,3,5-Trimethylbenzene	2.4	J
95-63-6-----	1,2,4-Trimethylbenzene	4.6	J
541-73-1-----	1,3-Dichlorobenzene	2.0	J
106-46-7-----	1,4-Dichlorobenzene	8.2	U
100-44-7-----	Benzyl chloride	8.2	U
95-50-1-----	1,2-Dichlorobenzene	8.2	U
120-82-1-----	1,2,4-Trichlorobenzene	8.2	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	8.2	U

JUL 17 '95 17:51 ROSS ANALYTICAL SERVICES, INC.

P.9
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

TB-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 40.8

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	4.603	52	J
2. 110-54-3	Hexane	12.235	56	NJ
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JUL 17 '95 17:51 ROSS ANALYTICAL SERVICES, INC.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

P.10
EPA SAMPLE NO.

TB-4 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 4.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

67-64-1-----	Acetone	14	
78-93-3-----	2-Butanone	0.82	U
108-10-1-----	4-Methyl-2-Pentanone	0.82	U
591-78-6-----	2-Hexanone	0.82	U
123-91-1-----	1,4-Dioxane	0.82	U
109-99-9-----	Tetrahydrofuran	0.82	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

TB-4 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703201A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703201A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 4.1

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Branched Alkane	7.725	8.3	J
2.	Unknown Branched Alkane	8.636	12	J
3. 110-54-3	Hexane	12.119	59	NJ
4.	Unknown Cyclic Alkane	13.145	8.6	J
5. 589-34-4	Hexane, 3-methyl-	14.685	6.8	NJ
6.	Unknown	23.068	6.6	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

P.12
EPA SAMPLE NO.

LFG-1 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX

Level: (low/med) LOW

Date Received: 07/01/95

* Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 359.9

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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74-87-3	Chloromethane	72	U
74-83-9	Bromomethane	72	U
75-01-4	Vinyl Chloride	72	U
75-00-3	Chloroethane	72	U
75-09-2	Methylene Chloride	1200	B
75-15-0	Carbon Disulfide	72	U
75-69-4	Trichlorofluoromethane	380000	E
75-35-4	1,1-Dichloroethene	72	U
156-60-5	trans-1,2-Dichloroethene	72	U
75-34-3	1,1-Dichloroethane	390	
107-06-2	1,2-Dichloroethane	72	U
67-66-3	Chloroform	72	U
75-71-8	Dichlorodifluoromethane	500000	E
71-55-6	1,1,1-Trichloroethane	72	U
56-23-5	Carbon Tetrachloride	72	U
75-27-4	Bromodichloromethane	72	U
78-87-5	1,2-Dichloropropane	72	U
10061-01-5	cis-1,3-Dichloropropene	72	U
79-01-6	Trichloroethene	4500	E
10061-02-6	trans-1,3-Dichloropropene	72	U
79-00-5	1,1,2-Trichloroethane	72	U
75-25-2	Bromoform	72	U
79-34-5	1,1,2,2-Tetrachloroethane	72	U
127-18-4	Tetrachloroethene	3000	
108-88-3	Toluene	27000	E
108-90-7	Chlorobenzene	72	U
100-41-4	Ethylbenzene	10000	E
100-42-5	Styrene	72	U
106-42-3	m,p-Xylene	19000	E
95-47-6	o-Xylene	10000	E
1330-20-7	Xylene (total)	29000	E
76-13-1	1,1,2-Trichloro-1,2,2-triflu	120	
156-59-2	cis-1,2-Dichloroethene	4700	E
124-48-1	Dibromochloromethane	72	U

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-1 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 359.9

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	72	U
108-67-8-----	1,3,5-Trimethylbenzene	830	
95-63-6-----	1,2,4-Trimethylbenzene	1700	
541-73-1-----	1,3-Dichlorobenzene	72	U
106-46-7-----	1,4-Dichlorobenzene	87	
100-44-7-----	Benzyl chloride	72	U
95-50-1-----	1,2-Dichlorobenzene	72	U
120-82-1-----	1,2,4-Trichlorobenzene	72	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	72	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-1 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 359.9

Number TICs found: 14

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-43-4	Methane, dichlorofluoro-	6.786	18000	NJ
2. 75-43-4	Methane, dichlorofluoro-	7.032	16000	NJ
3. 107-83-5	Pentane, 2-methyl-	10.977	6400	NJ
4. 96-37-7	Cyclopentane, methyl-	13.066	6700	NJ
5. 110-82-7	Cyclohexane	14.208	3700	NJ
6. 589-34-4	Hexane, 3-methyl-	14.612	2500	NJ
7. 108-87-2	Cyclohexane, methyl-	16.188	2200	NJ
8.	Unknown Cyclic Alkane	17.835	3100	J
9.	Unknown Branched Alkane	21.463	2300	J
10.	Unknown Branched Alkane	22.049	2200	J
11.	Unknown Branched Alkane	22.612	2000	J
12.	Unknown Aromatic	22.656	2600	J
13. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.815	5500	NJ
14. 611-14-3	Benzene, 1-ethyl-2-methyl-	23.342	1700	NJ
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1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-1DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 2040.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

74-87-3	Chloromethane	410	U
74-83-9	Bromomethane	410	U
75-01-4	Vinyl Chloride	410	U
75-00-3	Chloroethane	410	U
75-09-2	Methylene Chloride	2800	B
75-15-0	Carbon Disulfide	410	U
75-69-4	Trichlorofluoromethane	180000	E
75-35-4	1,1-Dichloroethene	410	U
156-60-5	trans-1,2-Dichloroethene	410	U
75-34-3	1,1-Dichloroethane	410	U
107-06-2	1,2-Dichloroethane	410	U
67-66-3	Chloroform	410	U
75-71-8	Dichlorodifluoromethane	110000	E
71-55-6	1,1,1-Trichloroethane	410	U
56-23-5	Carbon Tetrachloride	410	U
75-27-4	Bromodichloromethane	410	U
78-87-5	1,2-Dichloropropane	410	U
10061-01-5	cis-1,3-Dichloropropene	410	U
79-01-6	Trichloroethene	970	
10061-02-6	trans-1,3-Dichloropropene	410	U
79-00-5	1,1,2-Trichloroethane	410	U
75-25-2	Bromoform	410	U
79-34-5	1,1,2,2-Tetrachloroethane	410	U
127-18-4	Tetrachloroethene	540	
108-88-3	Toluene	26000	E
108-90-7	Chlorobenzene	410	U
100-41-4	Ethylbenzene	3600	
100-42-5	Styrene	410	U
106-42-3	m,p-Xylene	10000	
95-47-6	o-Xylene	2200	
1330-20-7	Xylene (total)	12000	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	410	U
156-59-2	cis-1,2-Dichloroethene	1300	
124-48-1	Dibromochloromethane	410	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-1DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 2040.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
106-93-4	1,2-Dibromoethane	410	U
108-67-8	1,3,5-Trimethylbenzene	95	J
95-63-6	1,2,4-Trimethylbenzene	200	J
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
100-44-7	Benzyl chloride	410	U
95-50-1	1,2-Dichlorobenzene	410	U
120-82-1	1,2,4-Trichlorobenzene	110	JB
87-68-3	1,1,2,3,4,4-Hexachloro-1,3-B	410	U

Post-It® Fax Note	7671	Date	7/17	# of pages	15
To	Andrew Beliveau	From	Amy Ross		
Co./Dept.	Metcalf & Eddy	Co.	ROSS		
Phone #		Phone #	2nd 15		
Fax #	617 245 6293	Fax #			

JUL 17 '95 17:55 ROSS ANALYTICAL SERVICES, INC.

P.2

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-1DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 2040.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	4.553	20000	J
2. 76-14-2	Dichlorotetrafluoroethane	4.589	250000	NJ
3. 75-43-4	Methane, dichlorofluoro-	7.219	11000	NJ
4.	Unknown Alkane	12.228	5000	J
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-1DL2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 71981.2

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	U
74-83-9	Bromomethane	U
75-01-4	Vinyl Chloride	U
75-00-3	Chloroethane	U
75-09-2	Methylene Chloride	B
75-15-0	Carbon Disulfide	U
75-69-4	Trichlorofluoromethane	260000
75-35-4	1,1-Dichloroethene	14000 U
156-60-5	trans-1,2-Dichloroethene	14000 U
75-34-3	1,1-Dichloroethane	14000 U
107-06-2	1,2-Dichloroethane	14000 U
67-66-3	Chloroform	14000 U
75-71-8	Dichlorodifluoromethane	210000
71-55-6	1,1,1-Trichloroethane	14000 U
56-23-5	Carbon Tetrachloride	14000 U
75-27-4	Bromodichloromethane	14000 U
78-87-5	1,2-Dichloropropane	14000 U
10061-01-5	cis-1,3-Dichloropropene	14000 U
79-01-6	Trichloroethene	14000 U
10061-02-6	trans-1,3-Dichloropropene	14000 U
79-00-5	1,1,2-Trichloroethane	14000 U
75-25-2	Bromoform	14000 U
79-34-5	1,1,2,2-Tetrachloroethane	14000 U
127-18-4	Tetrachloroethene	14000 U
108-88-3	Toluene	35000
108-90-7	Chlorobenzene	14000 U
100-41-4	Ethylbenzene	7700 J
100-42-5	Styrene	14000 U
106-42-3	m,p-Xylene	20000
95-47-6	o-Xylene	4900 J
1330-20-7	Xylene (total)	25000
76-13-1	1,1,2-Trichloro-1,2,2-triflu	14000 U
156-59-2	cis-1,2-Dichloroethene	1900 J
124-48-1	Dibromochloromethane	14000 U

JUL 17 '95 17:56 ROSS ANALYTICAL SERVICES, INC.

P.4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-1DL2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 71981.2

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	14000	U
108-67-8-----	1,3,5-Trimethylbenzene	1500	J
95-63-6-----	1,2,4-Trimethylbenzene	1600	J
541-73-1-----	1,3-Dichlorobenzene	14000	U
106-46-7-----	1,4-Dichlorobenzene	14000	U
100-44-7-----	Benzyl chloride	14000	U
95-50-1-----	1,2-Dichlorobenzene	14000	U
120-82-1-----	1,2,4-Trichlorobenzene	14000	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	14000	U

JUL 17 '95 1 ROSS ANALYTICAL SERVICES, INC.

P.5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-1DL2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 71981.2

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-14-2	Dichlorotetrafluoroethane	4.683	390000	NJ
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JUL 17 '95 17:57 ROSS ANALYTICAL SERVICES, INC.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

P.6

EPA SAMPLE NO.

LFG-1 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703202A2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 359.9

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

67-64-1-----	Acetone	72	U
78-93-3-----	2-Butanone	72	U
108-10-1-----	4-Methyl-2-Pentanone	72	U
591-78-6-----	2-Hexanone	72	U
123-91-1-----	1,4-Dioxane	72	U
109-99-9-----	Tetrahydrofuran	72	U

JUL 17 '95 17:57 ROSS ANALYTICAL SERVICES, INC.

P.7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-1 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703202A

Sample wt/vol: _____ (g/mL) mL

Lab File ID: 0703202A2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 359.9

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Freon	3.592	77000	J
2.	Unknown Freon	4.408	170000	J
3. 75-43-4	Methane, dichlorofluoro-	7.104	6900	NJ
4.	Unknown Branched Alkane	11.555	6000	J
5. 110-54-3	Hexane	12.134	11000	NJ
6. 111-84-2	Nonane	21.044	3300	NJ
7. 80-56-8	.alpha.-Pinene	22.265	4200	NJ
8. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.872	3400	NJ
9. 124-18-5	Decane	23.516	3500	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 350.8

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	70 U
74-83-9	Bromomethane	70 U
75-01-4	Vinyl Chloride	70 U
75-00-3	Chloroethane	70 U
75-09-2	Methylene Chloride	130 B
75-15-0	Carbon Disulfide	70 U
75-69-4	Trichlorofluoromethane	290
75-35-4	1,1-Dichloroethene	70 U
156-60-5	trans-1,2-Dichloroethene	70 U
75-34-3	1,1-Dichloroethane	70 U
107-06-2	1,2-Dichloroethane	70 U
67-66-3	Chloroform	70 U
75-71-8	Dichlorodifluoromethane	19000 E
71-55-6	1,1,1-Trichloroethane	70 U
56-23-5	Carbon Tetrachloride	70 U
75-27-4	Bromodichloromethane	70 U
78-87-5	1,2-Dichloropropane	70 U
10061-01-5	cis-1,3-Dichloropropene	70 U
79-01-6	Trichloroethene	64 J
10061-02-6	trans-1,3-Dichloropropene	70 U
79-00-5	1,1,2-Trichloroethane	70 U
75-25-2	Bromoform	70 U
79-34-5	1,1,2,2-Tetrachloroethane	70 U
127-18-4	Tetrachloroethene	320
108-88-3	Toluene	11000 E
108-90-7	Chlorobenzene	510
100-41-4	Ethylbenzene	9900 E
100-42-5	Styrene	70 U
106-42-3	m,p-Xylene	16000 E
95-47-6	o-Xylene	8400 E
1330-20-7	Xylene (total)	24000 E
76-13-1	1,1,2-Trichloro-1,2,2-triflu	70 U
156-59-2	cis-1,2-Dichloroethene	70 U
124-48-1	Dibromochloromethane	70 U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 350.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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106-93-4-----	1,2-Dibromoethane	70	U
108-67-8-----	1,3,5-Trimethylbenzene	4200	
95-63-6-----	1,2,4-Trimethylbenzene	3700	
541-73-1-----	1,3-Dichlorobenzene	460	
106-46-7-----	1,4-Dichlorobenzene	70	U
100-44-7-----	Benzyl chloride	70	U
95-50-1-----	1,2-Dichlorobenzene	70	U
120-82-1-----	1,2,4-Trichlorobenzene	70	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	70	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-2 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 350.8

Number TICs found: 17

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-65-9	Octane	18.320	6600	NJ
2. 111-84-2	Nonane	21.015	20000	NJ
3.	Unknown Branched Alkane	21.492	7600	J
4.	Unknown Cyclic Alkane	22.077	10000	J
5. 17301-94-9	Nonane, 4-methyl-	22.591	6600	NJ
6.	Unknown	22.656	32000	J
7. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.851	21000	NJ
8.	Unknown	23.371	9600	J
9. 124-18-5	Decane	23.501	35000	NJ
10.	Unknown Branched Alkane	23.956	7300	J
11.	Unknown Branched Alkane	24.058	8600	J
12.	Unknown Branched Alkane	24.123	15000	J
13.	Unknown Alkane	24.549	28000	J
14.	Unknown	25.011	22000	J
15.	Unknown Branched Alkane	25.084	14000	J
16.	Unknown Branched Alkane	25.452	10000	J
17. 1120-21-4	Undecane	25.792	10000	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-2DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 7016.1

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	1400	U
74-83-9-----	Bromomethane	1400	U
75-01-4-----	Vinyl Chloride	1400	U
75-00-3-----	Chloroethane	1400	U
75-09-2-----	Methylene Chloride	6700	B
75-15-0-----	Carbon Disulfide	1400	U
75-69-4-----	Trichlorofluoromethane	1700	
75-35-4-----	1,1-Dichloroethene	1400	U
156-60-5-----	trans-1,2-Dichloroethene	1400	U
75-34-3-----	1,1-Dichloroethane	1400	U
107-06-2-----	1,2-Dichloroethane	1400	U
67-66-3-----	Chloroform	1400	U
75-71-8-----	Dichlorodifluoromethane	4300	
71-55-6-----	1,1,1-Trichloroethane	1400	U
56-23-5-----	Carbon Tetrachloride	1400	U
75-27-4-----	Bromodichloromethane	1400	U
78-87-5-----	1,2-Dichloropropane	1400	U
10061-01-5-----	cis-1,3-Dichloropropene	1400	U
79-01-6-----	Trichloroethene	1400	U
10061-02-6-----	trans-1,3-Dichloropropene	1400	U
79-00-5-----	1,1,2-Trichloroethane	1400	U
75-25-2-----	Bromoform	1400	U
79-34-5-----	1,1,2,2-Tetrachloroethane	1400	U
127-18-4-----	Tetrachloroethene	1400	U
108-88-3-----	Toluene	7300	
108-90-7-----	Chlorobenzene	200	J
100-41-4-----	Ethylbenzene	13000	
100-42-5-----	Styrene	1400	U
106-42-3-----	m,p-Xylene	25000	
95-47-6-----	o-Xylene	5700	
1330-20-7-----	Xylene (total)	30000	
76-13-1-----	1,1,2-Trichloro-1,2,2-triflu	1400	U
156-59-2-----	cis-1,2-Dichloroethene	1400	U
124-48-1-----	Dibromochloromethane	1400	U

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-2DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 7016.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	1400	U
108-67-8-----	1,3,5-Trimethylbenzene	620	J
95-63-6-----	1,2,4-Trimethylbenzene	1100	J
541-73-1-----	1,3-Dichlorobenzene	170	J
106-46-7-----	1,4-Dichlorobenzene	1400	U
100-44-7-----	Benzyl chloride	1400	U
95-50-1-----	1,2-Dichlorobenzene	1400	U
120-82-1-----	1,2,4-Trichlorobenzene	1400	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	1400	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-2DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203AX3

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 7016.1

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Freon	4.762	14000	J
2. 111-84-2	Nonane	21.044	9900	NJ
3.	Unknown Branched Alkane	22.656	20000	J
4. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.865	9700	NJ
5. 124-18-5	Decane	23.501	19000	NJ
6.	Unknown Branched Alkane	24.123	7900	J
7. 527-84-4	Benzene, 1-methyl-2-(1-methy	24.404	11000	NJ
8.	Unknown Branched Alkane	24.542	17000	J
9.	Unknown Branched Alkane	25.011	11000	J
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JUL 17 '95 18:00 ROSS ANALYTICAL SERVICES, INC.

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-2 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 350.8

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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67-64-1-----	Acetone	1900	
78-93-3-----	2-Butanone	70	U
108-10-1-----	4-Methyl-2-Pentanone	70	U
591-78-6-----	2-Hexanone	70	U
123-91-1-----	1,4-Dioxane	70	U
109-99-9-----	Tetrahydrofuran	70	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-2 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703203A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703203A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 350.8

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-84-2	Nonane	21.008	10000	NJ
2.	Unknown Branched Alkane	21.492	4700	J
3.	Unknown Cyclic Alkane	22.077	4900	J
4.	Unknown Cyclic Alkane	22.641	22000	J
5. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.843	10000	NJ
6.	Unknown	23.371	5000	J
7. 124-18-5	Decane	23.487	22000	NJ
8.	Unknown Branched Alkane	24.108	11000	J
9. 99-87-6	Benzene, 1-methyl-4-(1-methyl-)	24.390	12000	NJ
10.	Unknown Branched Alkane	24.535	19000	J
11.	Unknown Branched Alkane	24.997	13000	J
12.	Unknown Branched Alkane	25.077	7200	J
13.	Unknown Branched Alkane	25.445	4800	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-3 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703204A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703204AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 391.3

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NO.	COMPOUND	Q
74-87-3	Chloromethane	78 U
74-83-9	Bromomethane	78 U
75-01-4	Vinyl Chloride	78 U
75-00-3	Chloroethane	78 U
75-09-2	Methylene Chloride	88 B
75-15-0	Carbon Disulfide	78 U
75-69-4	Trichlorofluoromethane	78 U
75-35-4	1,1-Dichloroethene	78 U
156-60-5	trans-1,2-Dichloroethene	78 U
75-34-3	1,1-Dichloroethane	78 U
107-06-2	1,2-Dichloroethane	78 U
67-66-3	Chloroform	78 U
75-71-8	Dichlorodifluoromethane	78 U
71-55-6	1,1,1-Trichloroethane	78 U
56-23-5	Carbon Tetrachloride	78 U
75-27-4	Bromodichloromethane	78 U
78-87-5	1,2-Dichloropropane	78 U
10061-01-5	cis-1,3-Dichloropropene	78 U
79-01-6	Trichloroethene	78 U
10061-02-6	trans-1,3-Dichloropropene	78 U
79-00-5	1,1,2-Trichloroethane	78 U
75-25-2	Bromoform	78 U
79-34-5	1,1,2,2-Tetrachloroethane	78 U
127-18-4	Tetrachloroethene	78 U
108-88-3	Toluene	160
108-90-7	Chlorobenzene	150
100-41-4	Ethylbenzene	220
100-42-5	Styrene	78 U
106-42-3	m,p-Xylene	780
95-47-6	o-Xylene	160
1330-20-7	Xylene (total)	920
76-13-1	1,1,2-Trichloro-1,2,2-triflu	78 U
156-59-2	cis-1,2-Dichloroethene	78 U
124-48-1	Dibromochloromethane	78 U

Post-It® Fax Note	7671	Date	7/17	# of pages	15
To	Andrew Beliveau	From	Amy Ross		
Co/Dept.	Metcalf & Eddy	Co.	ROSS		
Phone #		Phone #	2nd 15		
Fax #	617 245 6293	Fax #	3rd set (10)		

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-3 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703204A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703204AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 391.3

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
106-93-4-----	1,2-Dibromoethane	78	U
108-67-8-----	1,3,5-Trimethylbenzene	200	
95-63-6-----	1,2,4-Trimethylbenzene	700	
541-73-1-----	1,3-Dichlorobenzene	78	U
106-46-7-----	1,4-Dichlorobenzene	230	
100-44-7-----	Benzyl chloride	78	U
95-50-1-----	1,2-Dichlorobenzene	78	U
120-82-1-----	1,2,4-Trichlorobenzene	78	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	78	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LFG-3 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703204A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703204AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 391.3

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	21.037	2700	J
2.	Unknown	21.507	3200	J
3.	Unknown Branched Alkane	21.918	4100	J
4.	Unknown Branched Alkane	22.092	3500	J
5.	Unknown Branched Alkane	22.648	11000	J
6.	Unknown Branched Alkane	22.836	2600	J
7.	Unknown Branched Alkane	22.887	2800	J
8.	Unknown Cyclic Alkane	23.378	3900	J
9.	Unknown Branched Alkane	23.487	10000	J
10. 2847-72-5	Decane, 4-methyl-	24.058	5300	NJ
11.	Unknown Branched Alkane	24.115	3000	J
12.	Unknown Branched Alkane	24.549	6200	J
13.	Unknown Branched Alkane	25.011	3800	J
14.	Unknown Branched Alkane	25.091	2500	J
15.	Unknown Branched Alkane	25.170	2500	J
16.	Unknown PAH	25.460	3600	J
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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-3 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703204A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703204A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 391.3

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) PPBV	Q
67-64-1-----	Acetone	78	U
78-93-3-----	2-Butanone	78	U
108-10-1-----	4-Methyl-2-Pentanone	78	U
591-78-6-----	2-Hexanone	78	U
123-91-1-----	1,4-Dioxane	78	U
109-99-9-----	Tetrahydrofuran	78	U

JUL 17 '95 18:02 ROSS ANALYTICAL SERVICES, INC.

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EPA SAMPLE NO.

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LFG-3 P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703204A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703204A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 391.3

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Branched Alkane	20.148	570	J
2.	Unknown Alkane	21.066	950	J
3.	Unknown	21.535	1000	J
4.	Unknown Branched Alkane	21.955	1100	J
5.	Unknown Cyclic Alkene	22.114	1200	J
6. 14676-29-0	Heptane, 3-ethyl-2-methyl-	22.193	570	NJ
7.	Unknown Cyclic Alkane	22.497	560	J
8. 17301-94-9	Nonane, 4-methyl-	22.619	610	NJ
9.	Unknown Branched Alkane	22.677	2800	J
10.	Unknown Cyclic Alkane	23.400	910	J
11.	Unknown Branched Alkane	23.516	2100	J
12.	Unknown Branched Alkane	24.079	950	J
13.	Unknown Branched Alkane	24.137	650	J
14.	Unknown Branched Alkane	24.571	1200	J
15.	Unknown Branched Alkane	25.033	680	J
16.	Unknown PAH	25.474	680	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
74-87-3	Chloromethane	73	U
74-83-9	Bromomethane	73	U
75-01-4	Vinyl Chloride	73	U
75-00-3	Chloroethane	73	U
75-09-2	Methylene Chloride	73	U
75-15-0	Carbon Disulfide	73	U
75-69-4	Trichlorofluoromethane	3500	
75-35-4	1,1-Dichloroethene	73	U
156-60-5	trans-1,2-Dichloroethene	73	U
75-34-3	1,1-Dichloroethane	73	U
107-06-2	1,2-Dichloroethane	73	U
67-66-3	Chloroform	73	U
75-71-8	Dichlorodifluoromethane	13000	E
71-55-6	1,1,1-Trichloroethane	73	U
56-23-5	Carbon Tetrachloride	73	U
75-27-4	Bromodichloromethane	73	U
78-87-5	1,2-Dichloropropane	73	U
10061-01-5	cis-1,3-Dichloropropene	73	U
79-01-6	Trichloroethene	73	U
10061-02-6	trans-1,3-Dichloropropene	73	U
79-00-5	1,1,2-Trichloroethane	73	U
75-25-2	Bromoform	73	U
79-34-5	1,1,2,2-Tetrachloroethane	73	U
127-18-4	Tetrachloroethene	250	
108-88-3	Toluene	11000	E
108-90-7	Chlorobenzene	400	
100-41-4	Ethylbenzene	10000	E
100-42-5	Styrene	73	U
106-42-3	m,p-Xylene	16000	E
95-47-6	o-Xylene	8200	E
1330-20-7	Xylene (total)	24000	E
76-13-1	1,1,2-Trichloro-1,2,2-triflu	73	U
156-59-2	cis-1,2-Dichloroethene	73	U
124-48-1	Dibromochloromethane	73	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	73	U
108-67-8-----	1,3,5-Trimethylbenzene	1500	
95-63-6-----	1,2,4-Trimethylbenzene	2700	
541-73-1-----	1,3-Dichlorobenzene	73	U
106-46-7-----	1,4-Dichlorobenzene	310	
100-44-7-----	Benzyl chloride	73	U
95-50-1-----	1,2-Dichlorobenzene	73	U
120-82-1-----	1,2,4-Trichlorobenzene	73	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	73	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LFG-4 NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

Number TICs found: 17

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 76-14-2	Dichlorotetrafluoroethane	3.946	16000	NJ
2. 111-65-9	Octane	18.291	5000	NJ
3. 111-84-2	Nonane	20.979	18000	NJ
4.	Unknown Alkane	21.463	8600	J
5.	Unknown Cyclic Alkane	22.049	7200	J
6.	Unknown Branched Alkane	22.619	28000	J
7. 611-14-3	Benzene, 1-ethyl-2-methyl-	22.822	20000	NJ
8.	Unknown Cyclic Alkane	23.342	7200	J
9. 124-18-5	Decane	23.465	28000	NJ
10.	Unknown Branched Alkane	23.927	5100	J
11. 2847-72-5	Decane, 4-methyl-	24.021	5600	NJ
12.	Unknown Branched Alkane	24.086	12000	J
13.	Unknown Branched Alkane	24.318	6100	J
14.	Unknown Branched Alkane	24.513	23000	J
15.	Unknown Branched Alkane	24.975	17000	J
16.	Unknown Branched Alkane	25.048	9400	J
17.	Unknown Cyclic Alkane	25.416	5700	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

74-87-3	Chloromethane	730	U
74-83-9	Bromomethane	730	U
75-01-4	Vinyl Chloride	730	U
75-00-3	Chloroethane	730	U
75-09-2	Methylene Chloride	3800	B
75-15-0	Carbon Disulfide	730	U
75-69-4	Trichlorofluoromethane	2700	
75-35-4	1,1-Dichloroethene	730	U
156-60-5	trans-1,2-Dichloroethene	730	U
75-34-3	1,1-Dichloroethane	730	U
107-06-2	1,2-Dichloroethane	730	U
67-66-3	Chloroform	730	U
75-71-8	Dichlorodifluoromethane	5200	
71-55-6	1,1,1-Trichloroethane	730	U
56-23-5	Carbon Tetrachloride	730	U
75-27-4	Bromodichloromethane	730	U
78-87-5	1,2-Dichloropropane	730	U
10061-01-5	cis-1,3-Dichloropropene	730	U
79-01-6	Trichloroethene	730	U
10061-02-6	trans-1,3-Dichloropropene	730	U
79-00-5	1,1,2-Trichloroethane	730	U
75-25-2	Bromoform	730	U
79-34-5	1,1,2,2-Tetrachloroethane	730	U
127-18-4	Tetrachloroethene	730	U
108-88-3	Toluene	5900	
108-90-7	Chlorobenzene	730	U
100-41-4	Ethylbenzene	10000	
100-42-5	Styrene	730	U
106-42-3	m,p-Xylene	20000	
95-47-6	o-Xylene	4200	
1330-20-7	Xylene (total)	24000	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	730	U
156-59-2	cis-1,2-Dichloroethene	730	U
124-48-1	Dibromochloromethane	730	U

VOLATILE ORGANICS ANALYSIS DATA SHEET

P.25
EPA SAMPLE NO.

LFG-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	730	U
108-67-8-----	1,3,5-Trimethylbenzene	950	
95-63-6-----	1,2,4-Trimethylbenzene	740	
541-73-1-----	1,3-Dichlorobenzene	130	J
106-46-7-----	1,4-Dichlorobenzene	730	U
100-44-7-----	Benzyl chloride	730	U
95-50-1-----	1,2-Dichlorobenzene	730	U
120-82-1-----	1,2,4-Trichlorobenzene	730	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	730	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LFG-4DL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AX2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 75-45-6	Methane, chlorodifluoro-	3.678	5700	NJ
2. 111-84-2	Nonane	21.030	6200	NJ
3.	Unknown Branched Alkane	22.648	13000	J
4. 124-18-5	Decane	23.494	12000	NJ
5. 535-77-3	Benzene, 1-methyl-3-(1-methy	24.397	7000	NJ
6.	Unknown Alkane	24.535	11000	J
7.	Unknown Branched Alkane	25.004	7600	J
8.	Unknown Branched Alkane	25.084	4300	J
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JUL 17 '95 18:04 ROSS ANALYTICAL SERVICES, INC.

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VOLATILE ORGANICS ANALYSIS DATA SHEET

P.27
EPA SAMPLE NO.

LFG-4P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

67-64-1-----	Acetone	2600	
78-93-3-----	2-Butanone	73	U
108-10-1-----	4-Methyl-2-Pentanone	73	U
591-78-6-----	2-Hexanone	73	U
123-91-1-----	1,4-Dioxane	73	U
109-99-9-----	Tetrahydrofuran	73	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

LFG-4P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205A

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

Number TICs found: 14

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-84-2	Nonane	21.001	13000	NJ
2.	Unknown Branched Alkane	21.485	6300	J
3.	Unknown Cyclic Alkane	22.070	5800	J
4.	Unknown Branched Alkane	22.627	27000	J
5. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.836	13000	NJ
6.	Unknown	23.364	6200	J
7. 124-18-5	Decane	23.479	28000	NJ
8.	Unknown Branched Alkane	24.101	13000	J
9.	Unknown Branched Alkane	24.332	5100	J
10. 99-87-6	Benzene, 1-methyl-4-(1-methy	24.376	15000	NJ
11.	Unknown Branched Alkane	24.520	24000	J
12.	Unknown Branched Alkane	24.990	15000	J
13.	Unknown Branched Alkane	25.069	8100	J
14.	Unknown Branched Alkane	25.438	5300	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

LFG-4DUP NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXDP

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPEV Q

74-87-3-----	Chloromethane	73	U
74-83-9-----	Bromomethane	73	U
75-01-4-----	Vinyl Chloride	73	U
75-00-3-----	Chloroethane	73	U
75-09-2-----	Methylene Chloride	73	U
75-15-0-----	Carbon Disulfide	73	U
75-69-4-----	Trichlorofluoromethane	3600	
75-35-4-----	1,1-Dichloroethene	73	U
156-60-5-----	trans-1,2-Dichloroethene	73	U
75-34-3-----	1,1-Dichloroethane	73	U
107-06-2-----	1,2-Dichloroethane	73	U
67-66-3-----	Chloroform	73	U
75-71-8-----	Dichlorodifluoromethane	13000	E
71-55-6-----	1,1,1-Trichloroethane	73	U
56-23-5-----	Carbon Tetrachloride	73	U
75-27-4-----	Bromodichloromethane	73	U
78-87-5-----	1,2-Dichloropropane	73	U
10061-01-5-----	cis-1,3-Dichloropropene	73	U
79-01-6-----	Trichloroethene	73	U
10061-02-6-----	trans-1,3-Dichloropropene	73	U
79-00-5-----	1,1,2-Trichloroethane	73	U
75-25-2-----	Bromoform	73	U
79-34-5-----	1,1,2,2-Tetrachloroethane	73	U
127-18-4-----	Tetrachloroethene	250	
108-88-3-----	Toluene	12000	E
108-90-7-----	Chlorobenzene	420	
100-41-4-----	Ethylbenzene	10000	E
100-42-5-----	Styrene	73	U
106-42-3-----	m,p-Xylene	18000	E
95-47-6-----	o-Xylene	8800	E
1330-20-7-----	Xylene (total)	26000	E
76-13-1-----	1,1,2-Trichloro-1,2,2-triflu	73	U
156-59-2-----	cis-1,2-Dichloroethene	73	U
124-48-1-----	Dibromochloromethane	73	U

JUL 17 '95 18:05 ROSS ANALYTICAL SERVICES, INC.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

P.30
EPA SAMPLE NO.

LFG-4DUP NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXDP

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	73	U
108-67-8-----	1,3,5-Trimethylbenzene	1700	
95-63-6-----	1,2,4-Trimethylbenzene	3200	
541-73-1-----	1,3-Dichlorobenzene	73	U
106-46-7-----	1,4-Dichlorobenzene	360	
100-44-7-----	Benzyl chloride	73	U
95-50-1-----	1,2-Dichlorobenzene	73	U
120-82-1-----	1,2,4-Trichlorobenzene	73	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-E	73	U

JUL 17 '95 18:06 ROSS ANALYTICAL SERVICES, INC.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

P.31
EPA SAMPLE NO.

LFG-4DUP NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXDP

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

Number TICs found: 17

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-65-9	Octane	18.291	5200	NJ
2.	Unknown Branched Alkane	20.076	4600	J
3. 111-84-2	Nonane	20.979	19000	NJ
4.	Unknown Alkane	21.456	6500	J
5.	Unknown Cyclic Alkane	22.049	6600	J
6.	Unknown Branched Alkane	22.619	31000	J
7. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.815	23000	NJ
8.	Unknown Cyclic Alkane	23.342	8800	J
9. 124-18-5	Decane	23.465	34000	NJ
10.	Unknown Branched Alkane	23.927	6400	J
11. 2847-72-5	Decane, 4-methyl-	24.029	7000	NJ
12.	Unknown Branched Alkane	24.086	14000	J
13.	Unknown Branched Alkane	24.513	27000	J
14.	Unknown Branched Alkane	24.975	19000	J
15.	Unknown Branched Alkane	25.048	11000	J
16.	Unknown Branched Alkane	25.416	7600	J
17. 1120-21-4	Undecane	25.763	6500	NJ
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-4DUPDL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205AX

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXD2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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74-87-3	Chloromethane	730	U
74-83-9	Bromomethane	730	U
75-01-4	Vinyl Chloride	730	U
75-00-3	Chloroethane	730	U
75-09-2	Methylene Chloride	3600	B
75-15-0	Carbon Disulfide	730	U
75-69-4	Trichlorofluoromethane	2300	
75-35-4	1,1-Dichloroethene	730	U
156-60-5	trans-1,2-Dichloroethene	730	U
75-34-3	1,1-Dichloroethane	730	U
107-06-2	1,2-Dichloroethane	730	U
67-66-3	Chloroform	730	U
75-71-8	Dichlorodifluoromethane	4900	
71-55-6	1,1,1-Trichloroethane	730	U
56-23-5	Carbon Tetrachloride	730	U
75-27-4	Bromodichloromethane	730	U
78-87-5	1,2-Dichloropropane	730	U
10061-01-5	cis-1,3-Dichloropropene	730	U
79-01-6	Trichloroethene	730	U
10061-02-6	trans-1,3-Dichloropropene	730	U
79-00-5	1,1,2-Trichloroethane	730	U
75-25-2	Bromoform	730	U
79-34-5	1,1,2,2-Tetrachloroethane	730	U
127-18-4	Tetrachloroethene	730	U
108-88-3	Toluene	5500	
108-90-7	Chlorobenzene	730	U
100-41-4	Ethylbenzene	9200	
100-42-5	Styrene	730	U
106-42-3	m,p-Xylene	18000	
95-47-6	o-Xylene	3800	
1330-20-7	Xylene (total)	21000	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	730	U
156-59-2	cis-1,2-Dichloroethene	730	U
124-48-1	Dibromochloromethane	730	U

Post-It® Fax Note	7671	Date	7/17	# of pages	15
To	Andrew Beliveau	From	Myra Ross		
Co./Dept.	Metcalf & Eddy	Co.	ROSS		
Phone #		Phone #	2nd 15		
Fax #	617 345 6293	Fax #	3rd set (16)		

4th set (16)

1/87 Rev.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-4DUPDL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205AX

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXD2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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106-93-4-----	1,2-Dibromoethane	730	U
108-67-8-----	1,3,5-Trimethylbenzene	850	
95-63-6-----	1,2,4-Trimethylbenzene	640	J
541-73-1-----	1,3-Dichlorobenzene	99	J
106-46-7-----	1,4-Dichlorobenzene	730	U
100-44-7-----	Benzyl chloride	730	U
95-50-1-----	1,2-Dichlorobenzene	730	U
120-82-1-----	1,2,4-Trichlorobenzene	730	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	730	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-4DUPDL NP

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205AX

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205AXD2

Level: (low/med) LOW

Date Received: 07/01/95

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 3650.7

Number TICs found: 8

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 593-70-4	Methane, chlorofluoro-	4.712	16000	NJ
2. 111-84-2	Nonane	20.993	5900	NJ
3.	Unknown Branched Alkane	22.612	12000	J
4. 124-18-5	Decane	23.458	11000	NJ
5.	Unknown Branched Alkane	24.072	5100	J
6. 99-87-6	Benzene, 1-methyl-4-(1-methy	24.354	6200	NJ
7.	Unknown Branched Alkane	24.498	10000	J
8.	Unknown Branched Alkane	24.968	6600	J
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JUL 17 '95 18:08 ROSS ANALYTICAL SERVICES, INC.

P.4

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFG-4DUP P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205ADP

Level: (low/med) LOW

Date Received: 07/01/99

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) PPBV	Q
67-64-1-----	Acetone	2500	
78-93-3-----	2-Butanone	73	U
108-10-1-----	4-Methyl-2-Pentanone	73	U
591-78-6-----	2-Hexanone	73	U
123-91-1-----	1,4-Dioxane	73	U
109-99-9-----	Tetrahydrofuran	73	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

LFG-4DUP P

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: 950703205A

Sample wt/vol: _____ (g/mL) ML

Lab File ID: 0703205ADP

Level: (low/med) LOW

Date Received: 07/01/99

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 365.1

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-84-2	Nonane	21.001	13000	NJ
2.	Unknown Branched Alkane	21.485	6300	J
3.	Unknown Cyclic Alkane	22.070	6000	J
4.	Unknown Branched Alkane	22.634	26000	J
5. 620-14-4	Benzene, 1-ethyl-3-methyl-	22.836	13000	NJ
6.	Unknown Cyclic Alkane	23.364	6200	J
7. 124-18-5	Decane	23.479	28000	NJ
8.	Unknown Branched Alkane	24.101	14000	J
9. 99-87-6	Benzene, 1-methyl-4-(1-methyl-)	24.383	16000	NJ
10.	Unknown Branched Alkane	24.527	25000	J
11.	Unknown Branched Alkane	24.990	16000	J
12.	Unknown Branched Alkane	25.069	9600	J
13.	Unknown Branched Alkane	25.438	6200	J
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0705C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0705C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0705C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/05/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
74-87-3	-----Chloromethane	0.20	U
74-83-9	-----Bromomethane	0.20	U
75-01-4	-----Vinyl Chloride	0.20	U
75-00-3	-----Chloroethane	0.20	U
75-09-2	-----Methylene Chloride	0.92	
75-15-0	-----Carbon Disulfide	0.20	U
75-69-4	-----Trichlorofluoromethane	0.20	U
75-35-4	-----1,1-Dichloroethene	0.20	U
156-60-5	-----trans-1,2-Dichloroethene	0.20	U
75-34-3	-----1,1-Dichloroethane	0.20	U
107-06-2	-----1,2-Dichloroethane	0.20	U
67-66-3	-----Chloroform	0.20	U
75-71-8	-----Dichlorodifluoromethane	0.20	U
71-55-6	-----1,1,1-Trichloroethane	0.20	U
56-23-5	-----Carbon Tetrachloride	0.20	U
75-27-4	-----Bromodichloromethane	0.20	U
78-87-5	-----1,2-Dichloropropane	0.20	U
10061-01-5	-----cis-1,3-Dichloropropene	0.20	U
79-01-6	-----Trichloroethene	0.20	U
10061-02-6	-----trans-1,3-Dichloropropene	0.20	U
79-00-5	-----1,1,2-Trichloroethane	0.20	U
75-25-2	-----Bromoform	0.20	U
79-34-5	-----1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	-----Tetrachloroethene	0.20	U
108-88-3	-----Toluene	0.20	U
108-90-7	-----Chlorobenzene	0.20	U
100-41-4	-----Ethylbenzene	0.20	U
100-42-5	-----Styrene	0.20	U
106-42-3	-----m,p-Xylene	0.20	U
95-47-6	-----o-Xylene	0.20	U
	-----Xylene (total)	0.20	U
76-13-1	-----1,1,2-Trichloro-1,2,2-triflu	0.20	U
156-59-2	-----cis-1,2-Dichloroethene	0.20	U
124-48-1	-----Dibromochloromethane	0.20	U

JUL 17 '95 18:10 ROSS ANALYTICAL SERVICES, INC.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

P.7

EPA SAMPLE NO.

VBK0705C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBK0705C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBK0705C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/05/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	0.20	U
108-67-8-----	1,3,5-Trimethylbenzene	0.20	U
95-63-6-----	1,2,4-Trimethylbenzene	0.20	U
541-73-1-----	1,3-Dichlorobenzene	0.20	U
106-46-7-----	1,4-Dichlorobenzene	0.20	U
100-44-7-----	Benzyl chloride	0.20	U
95-50-1-----	1,2-Dichlorobenzene	0.20	U
120-82-1-----	1,2,4-Trichlorobenzene	0.055	J
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	0.20	U

JUL 17 '95 18:10 ROSS ANALYTICAL SERVICES, INC.

P.8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VELK0705C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0705C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0705C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/05/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Carbon Dioxide	3.093	3.0	J
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0710C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0710C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0710C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	0.20	U
74-83-9-----	Bromomethane	0.20	U
75-01-4-----	Vinyl Chloride	0.20	U
75-00-3-----	Chloroethane	0.20	U
75-09-2-----	Methylene Chloride	0.37	
75-15-0-----	Carbon Disulfide	0.20	U
75-69-4-----	Trichlorofluoromethane	0.20	U
75-35-4-----	1,1-Dichloroethene	0.20	U
156-60-5-----	trans-1,2-Dichloroethene	0.20	U
75-34-3-----	1,1-Dichloroethane	0.20	U
107-06-2-----	1,2-Dichloroethane	0.20	U
67-66-3-----	Chloroform	0.20	U
75-71-8-----	Dichlorodifluoromethane	0.20	U
71-55-6-----	1,1,1-Trichloroethane	0.20	U
56-23-5-----	Carbon Tetrachloride	0.20	U
75-27-4-----	Bromodichloromethane	0.20	U
78-87-5-----	1,2-Dichloropropane	0.20	U
10061-01-5-----	cis-1,3-Dichloropropene	0.20	U
79-01-6-----	Trichloroethene	0.20	U
10061-02-6-----	trans-1,3-Dichloropropene	0.20	U
79-00-5-----	1,1,2-Trichloroethane	0.20	U
75-25-2-----	Bromoform	0.20	U
79-34-5-----	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4-----	Tetrachloroethene	0.20	U
108-88-3-----	Toluene	0.20	U
108-90-7-----	Chlorobenzene	0.20	U
100-41-4-----	Ethylbenzene	0.20	U
100-42-5-----	Styrene	0.20	U
106-42-3-----	m,p-Xylene	0.20	U
95-47-6-----	o-Xylene	0.20	U
1330-20-7-----	Xylene (total)	0.20	U
76-13-1-----	1,1,2-Trichloro-1,2,2-triflu	0.20	U
156-59-2-----	cis-1,2-Dichloroethene	0.20	U
124-48-1-----	Dibromochloromethane	0.20	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0710C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0710C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0710C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
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106-93-4-----	1,2-Dibromoethane	0.20	U
108-67-8-----	1,3,5-Trimethylbenzene	0.20	U
95-63-6-----	1,2,4-Trimethylbenzene	0.20	U
541-73-1-----	1,3-Dichlorobenzene	0.20	U
106-46-7-----	1,4-Dichlorobenzene	0.20	U
100-44-7-----	Benzyl chloride	0.20	U
95-50-1-----	1,2-Dichlorobenzene	0.20	U
120-82-1-----	1,2,4-Trichlorobenzene	0.20	U
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-B	0.20	U

JUL 17 '95 18:11 ROSS ANALYTICAL SERVICES, INC.

P.11
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBK0710C2

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBK0710C2

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBK0710C2

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/10/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Carbon Dioxide	3.064	1.9	J
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VOLATILE ORGANICS ANALYSIS DATA SHEET

P.12
EPA SAMPLE NO.

VBLK0712C

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0712C

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0712C

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) PPBV	Q
74-87-3	-----Chloromethane	0.20	U
74-83-9	-----Bromomethane	0.20	U
75-01-4	-----Vinyl Chloride	0.20	U
75-00-3	-----Chloroethane	0.20	U
75-09-2	-----Methylene Chloride	0.45	U
75-15-0	-----Carbon Disulfide	0.20	U
75-69-4	-----Trichlorofluoromethane	0.20	U
75-35-4	-----1,1-Dichloroethene	0.20	U
156-60-5	-----trans-1,2-Dichloroethene	0.20	U
75-34-3	-----1,1-Dichloroethane	0.20	U
107-06-2	-----1,2-Dichloroethane	0.20	U
67-66-3	-----Chloroform	0.20	U
75-71-8	-----Dichlorodifluoromethane	0.20	U
71-55-6	-----1,1,1-Trichloroethane	0.20	U
56-23-5	-----Carbon Tetrachloride	0.20	U
75-27-4	-----Bromodichloromethane	0.20	U
78-87-5	-----1,2-Dichloropropane	0.20	U
10061-01-5	-----cis-1,3-Dichloropropene	0.20	U
79-01-6	-----Trichloroethene	0.20	U
10061-02-6	-----trans-1,3-Dichloropropene	0.20	U
79-00-5	-----1,1,2-Trichloroethane	0.20	U
75-25-2	-----Bromoform	0.20	U
79-34-5	-----1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	-----Tetrachloroethene	0.20	U
108-88-3	-----Toluene	0.20	U
108-90-7	-----Chlorobenzene	0.20	U
100-41-4	-----Ethylbenzene	0.20	U
100-42-5	-----Styrene	0.20	U
106-42-3	-----m,p-Xylene	0.20	U
95-47-6	-----o-Xylene	0.20	U
1330-20-7	-----Xylene (total)	0.20	U
76-13-1	-----1,1,2-Trichloro-1,2,2-triflu	0.20	U
156-59-2	-----cis-1,2-Dichloroethene	0.20	U
124-48-1	-----Dibromochloromethane	0.20	U

JUL 17 '95 18:12 ROSS ANALYTICAL SERVICES, INC.

P.13

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK0712C

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0712C

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0712C

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

106-93-4-----	1,2-Dibromoethane	0.20	U
108-67-8-----	1,3,5-Trimethylbenzene	0.20	U
95-63-6-----	1,2,4-Trimethylbenzene	0.20	U
541-73-1-----	1,3-Dichlorobenzene	0.20	U
106-46-7-----	1,4-Dichlorobenzene	0.20	U
100-44-7-----	Benzyl chloride	0.20	U
95-50-1-----	1,2-Dichlorobenzene	0.20	U
120-82-1-----	1,2,4-Trichlorobenzene	0.073	J
87-68-3-----	1,1,2,3,4,4-Hexachloro-1,3-E	0.20	U

JUL 17 '95 18:12 ROSS ANALYTICAL SERVICES, INC.

P.14

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBK0712C

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBK0712C

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBK0712C

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/12/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.	noise	0.463	2.0	J
2. 124-38-9	Carbon Dioxide	3.172	2.8	J
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JUL 17 '95 18:12 ROSS ANALYTICAL SERVICES, INC.

P.15

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

VBLK0714C

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: JULY14

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0714C

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0714C

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV Q

67-64-1-----	Acetone	0.20	U
78-93-3-----	2-Butanone	0.20	U
108-10-1-----	4-Methyl-2-Pentanone	0.20	U
591-78-6-----	2-Hexanone	0.20	U
123-91-1-----	1,4-Dioxane	0.20	U
109-99-9-----	Tetrahydrofuran	0.20	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK0714C

Lab Name: ROSS ANALYTICAL SERVICES, Contract:

Lab Code: ROSS Case No.: 032135 SAS No.: METCALF & EDDY SDG No.: 07032

Matrix: (soil/water) AIR

Lab Sample ID: VBLK0714C

Sample wt/vol: _____ (g/mL) ML

Lab File ID: VBLK0714C

Level: (low/med) LOW

Date Received:

% Moisture: not dec. _____

Date Analyzed: 07/14/95

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) PPBV

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Carbon Dioxide	3.093	2.9	J
2. 75-09-2	Methylene Chloride	9.944	1.3	NJ
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

Chain of Custody Forms

Number 017672-003

3. Date and Time of Collection: 6/27/95

4. Name and Location: Leicester

4. Number of Samples: 44

ROCCO LAND FILL

5. Collector(s): Richard Bursaw

Address: _____

Telephone #: _____

Item Number TEMP 29/6

Sample Description

Field Number

Laboratory Number

1	SW-1	SUOC	95-1772
2	SW-1	WV	95-1773
3	SW-1		95-1774
4	SW-1		95-1775
5	SW-1		95-1776
6	SW-1		95-1777
7	SW-1 SW-2		95-1778 95-1778
8	SW-2		95-1779
9	SW-2		95-1780
10	SW-2		95-1781
11	SW-2		95-1782
12	SW-2		95-1783
13	SW-3		95-1784
14	SW-3		95-1785
15	SW-3		95-1786
16	SW-3		95-1787
17	SW-3		95-1788
18	SW-3		95-1789
19	SW-4		95-1790
20	SW-4		95-1791
21	SW-4		95-1792

Item No.	Relinquished By:	Received By:	Purpose of C. of C.
	Printed Name: <u>RICHARD B. BURSAW</u>	Printed Name: <u>Dennis Brown</u>	
	Signature: <u>[Signature]</u> Date: <u>6-29-95</u>	Signature: <u>[Signature]</u> Date: <u>6/27/95</u>	
	Printed Name: _____	Printed Name: _____	
	Signature: _____ Date: _____	Signature: _____ Date: _____	
	Printed Name: _____	Printed Name: _____	
	Signature: _____ Date: _____	Signature: _____ Date: _____	
	Printed Name: _____	Printed Name: _____	
	Signature: _____ Date: _____	Signature: _____ Date: _____	

CHAIN OF CUSTODY

1. Case Number 017672-003

3. Date and Time of Collection: _____

2. Site Name and Location: Tewksbury

4. Number of Samples: 44

Rocco Landfill

5. Collector(s): _____

Address: _____

Telephone #: _____

Item Number	Field Number	Laboratory Number
22	SW-4 SW-4	95-1793
23	SW-4	95-1794
24	SW-4	95-1795
25	SED-1	95-1796
26	SED-1	95-1797
27	SED-1	95-1798
28	SED-1	95-1799
29	SED-2	95-1800
30	SED-2	95-1801
31	SED-2	95-1802
32	SED-2	95-1803
33	SED-2	95-1804
34	SED-3	95-1805
35	SED-3	95-1806
36	SED-3	95-1807
37	SED-3	95-1808
38	SED-3	95-1809
39	SED-4	95-1810
40	SED-4	95-1811
41	SED-4	95-1812
42	SED-4	95-1813
43	SED-4	95-1814

Item No.	Relinquished By:	Received By:	Purpose of C. of
44	TP-1 - 35 samples	95-1815	
	Printed Name: RICHARD B. BULSAW	Printed Name: Dennis Brown	
	Signature: <i>[Signature]</i> Date: 6-29-95	Signature: <i>[Signature]</i> Date: 6/27/95	
	Printed Name:	Printed Name:	
	Signature: Date:	Signature: Date:	
	Printed Name:	Printed Name:	
	Signature: Date:	Signature: Date:	
	Printed Name:	Printed Name:	
	Signature: Date:	Signature: Date:	

CHAIN OF CUSTODY FORM

Job/Project Name:		Job/Project Location:		Job/Project Number:		
Raccoon headfield		Raccoon headfield		017689 - area 3		
Samplers: (Signatures)		Recorder: (Signature)		Date:		
Lab (Samples Sent To)				01/27/94		
SAMPLING		SAMPLE NUMBER	SAMPLE LOCATION	MATRIX	ANALYSIS REQUESTED	COMMENTS
Date	Time			Water Soil	PREPARED/Y/N	Total # Samples
6/27/94	1130	SW-3		X	X	7
	1130	SW-4		X	X	7
	1200	SED-3		X	X	5
	1200	SED-4		X	X	5
	1330	SW-2		X	X	7
	1345	SED-2		X	X	5
	1445	SW-1		X	X	7
	1500	SED-1		X	X	5
	0930	TB-1		X	X	2
Relinquished By: (Signature)		Date:	Time:	Relinquished By: (Signature)	Date:	Received By: (Signature)
<i>[Signature]</i>		6/27/94	1415			
Relinquished By: (Signature)		Date:	Time:	Relinquished By: (Signature)	Date:	Received By: (Signature)
Relinquished By: (Signature)		Date:	Time:	Received for Lab By: (Signature)	Date:	Comments: Preservative = 50% Ice to 4°C
Method of Shipment:						



CHAIN OF CUSTODY FORM

Job/Project Name: <u>Little LANDFILL</u>		Job/Project Location: <u>RORCO LANDFILL</u>		Job/Project Number: <u>017692-0003</u>	
Samplers: (Signatures) <u>Chapman R. R. R.</u>		Recorder: (Signature) <u>Chapman R. R. R.</u>		Date: <u>12/13/93</u>	
Lab (Samples Sent To): <u>MA DSP / Lawrence</u>		MATRIX		ANALYSIS REQUESTED	
SAMPLE LOCATION		COMPOSITE/GRAB		PRESERVATIVE (Y/N)	
SAMPLE NUMBER		Soil		VIA (Seal)	
SAMPLING		Water		Metals	
Date		Time		Total # B.N.s	
6/27/93		0930		T15-1	
		1130		SW-3	
		1130		SW-4	
		1200		SED-3	
		1200		SED-4	
		1330		SW-2	
		1345		SED-2	
		1415		SW-1	
		1500		SED-1	
Relinquished By: (Signature) <u>Chapman R. R. R.</u>		Date: <u>4/27/93</u>		Time: <u>1615</u>	
Relinquished By: (Signature)		Date:		Time:	
Relinquished By: (Signature)		Date:		Time:	
Relinquished By: (Signature)		Date:		Time:	
Method of Shipment:		Received for Lab By: (Signature)		Date:	
Comments: <u>Per Serv. Instr. (A9)</u> <u>VIA: HCl PN-2</u> <u>SUA: 1cc 6.4°C</u> <u>Metals: MU03</u>		Comments: <u>Per Serv. Instr. (A9)</u> <u>VIA: HCl PN-2</u> <u>SUA: 1cc 6.4°C</u> <u>Metals: MU03</u>		Comments: <u>Per Serv. Instr. (A9)</u> <u>VIA: HCl PN-2</u> <u>SUA: 1cc 6.4°C</u> <u>Metals: MU03</u>	

Distribution: Original to Lab. Copy 1 to Field Files, Copy 2 to Project Manager



CHAIN OF CUSTODY FORM

Job/Project Name: <u>Kisco Landfill</u>		Job/Project Location: <u>Rocco Landfill</u>		Job/Project Number: <u>017682-0005</u>																									
Samplers: (Signatures) <u>Chapman R. Brown</u>		Recorder: (Signature) <u>Chapman R. Brown</u>		Date: <u>10/27/95</u>																									
Lab (Samples Sent To): <u>MD DEP / Lawrence</u>		Matrix:		ANALYSIS REQUESTED																									
SAMPLING		SAMPLE LOCATION		SAMPLE NUMBER		COMPOSITE/GRAB		PRESERVATIVE (Y/N)		VOC (GAL)		SVOC		Metals		PCB		TPH		Mo		Fe		Chloride		Total # B.N.s		COMMENTS	
Date	Time			Water	Soil																								
<u>6/27/95</u>	<u>0930</u>	<u>TK-1</u>																											
	<u>1130</u>	<u>SW-3</u>																											
	<u>1130</u>	<u>SW-4</u>																											
	<u>1200</u>	<u>SED-3</u>																											
	<u>1200</u>	<u>SED-4</u>																											
	<u>1330</u>	<u>SW-2</u>																											
	<u>1345</u>	<u>SED-2</u>																											
	<u>1445</u>	<u>SW-1</u>																											
	<u>1500</u>	<u>SED-1</u>																											
Relinquished By: (Signature) <u>Chapman</u>		Date: <u>4/27/95</u>		Time: <u>1615</u>		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:	
Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:	
Relinquished By: (Signature)		Date:		Time:		Received for Lab By: (Signature)		Date:		Time:		Comments: <u>Perseverance: Ag</u> <u>VOA: NC1 PM 22</u> <u>SVOC: 1cc 1640C</u> <u>Metals: 1603</u>		Date:		Time:		Comments: <u>Perseverance: Ag</u> <u>VOA: NC1 PM 22</u> <u>SVOC: 1cc 1640C</u> <u>Metals: 1603</u>		Date:		Time:		Comments: <u>Perseverance: Ag</u> <u>VOA: NC1 PM 22</u> <u>SVOC: 1cc 1640C</u> <u>Metals: 1603</u>					
Method of Shipment:																													

CHAIN OF CUSTODY FORM

Metcalf & Eddy

Job/Project Name: <u>Rocky Mountain</u>		Job/Project Location: <u>Rocky Mountain</u>		Job/Project Number: <u>017677-0003</u>	
Samplers: (Signatures) <u>Debra J. Taylor</u>		Recorder: (Signature) <u>Debra J. Taylor</u>		Date: <u>10/27/93</u>	
Lab (Samples Sent To):		MATRIX		ANALYSIS REQUESTED	
SAMPLING		SAMPLE LOCATION		COMPOSITE/GRAB	
Date	Time	Water	Soil	PREPERSATIVE (Y/N)	Total # bottles
6/27/93	1130	X		Y	7
	1130	X		Y	7
	1200		X	Y	5
	1200		X	Y	5
	1330	X		Y	7
	1345		X	Y	5
	1445	X		Y	7
	1500		X	Y	5
	0930	X		Y	2

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:
<u>Debra J. Taylor</u>	<u>6/27/93</u>	<u>1615</u>									

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Date:	Time:

Relinquished By: (Signature)

Distribution: Original to Lab. Copy 1 to Field Files, Copy 2 to Project Manager

Rev 5/89)

CHAIN OF CUSTODY FORMS

1 of 3

Case Number: _____

Date of Collection: 6/28/95

Site Name and Location

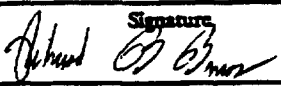

Collected by: RB/col/BBRaccoon Landfill
Truistbury, MA

26/6

Item Number

Sample Description

	Field Number	Laboratory Number
1	TB-2A; TB-2B (VOA)	95-1902
2	MW-0045A; MW-0045B (VCA)	95-1903
3	MW-0045C; (SVOA)	95-1904
4	MW-0045D (PCB)	95-1905
5	MW-0045E (Metals)	95-1906
6	MW-0045G (Mn + Fe)	95-1907
7	MW-0045H (Cl, TDS, Sulfate, Alk)	95-1908
8	MW-0045F (N/N, COD)	95-1909
9	MW-004BA; MW-0045B (VCA)	95-1910
10	MW-004BC (SVOA)	95-1911
11	MW-004BD (PCB)	95-1912
12	MW-004BE (Metals)	95-1913
13	MW-004BG (Mn + Fe)	95-1914
14	MW-004BH (Cl, TDS, Sulfate, Alk)	95-1915
15	MW-004BI (N/N, COD)	95-1916

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
	6/29	Printed Name RICHARD BURSAR	Printed Name Dennis Browne	
		Signature 	Signature 	
		Printed Name	Printed Name	
		Signature	Signature	
		Printed Name	Printed Name	
		Signature	Signature	

CHAIN OF CUSTODY FORMS

Case Number: _____

Date of Collection: 6/28/95 263

Site Name and Location

Pocco's Landfill

Collected by:

B. Buelow
C. Page
R. Buelow

266

Item Number

Sample Description

	Field Number	Laboratory Number
16	MW-005A ; MW-005B (VOA)	95-1917
17	MW-005C (PCB)	95-1918
18	MW-005D (SVOA)	95-1919
19	MW-005E (metals)	95-1920
20	MW-005F (MN+Fe)	95-1921
21	MW-005H (Chloride, Sulfate etc...)	95-1922
22	MW-005I (NIN+COD)	95-1923
23	MW-006A, B (VOA)	95-1924
24	MW-006C (SVOA)	95-1925
25	MW-006D (PCB)	95-1926
26	MW-006E (Metals)	95-1927
27	MW-006F (NIN+COD)	95-1928
28	MW-006G (Chloride etc...)	95-1929
29	MW-006H (MN+Fe)	95-1930
30	MW-002SA ; MW-002SB (VOA)	95-1931

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
	6/29	Printed Name RICHARD BURSAW	Printed Name DENNIS BROWN	
		Signature <i>Richard B. Buelow</i>	Signature <i>Dennis Brown</i>	
		Printed Name	Printed Name	
		Signature	Signature	
		Printed Name	Printed Name	
		Signature	Signature	

CHAIN OF CUSTODY FORMS

3 of 3

Case Number: _____

Date of Collection: 6/28/95

Site Name and Location

Collected by: Charles

Raccoon Landfill

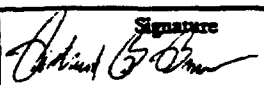

2/10

R. Bursaw
K. Bursaw

Item Number

Sample Description

	Field Number	Laboratory Number
31	MW-002SC (SVOA)	95-1932
32	MW-002SD (PCB)	95-1933
33	MW-002SE (metals)	95-1934
34	MW-002SG (Mn+Fe)	95-1935
35	MW-002SH (Cl, TDS, Sulphate, Alkalinity)	95-1936
36	MW-002SI (N/N+COD)	95-1937
37	MW-002BA \ MW-002BB	95-1938
38	MW-002BC (SVOA)	95-1939
39	MW-002BD (PCB)	95-1940
40	MW-002BE (metals)	95-1941
41	MW-002BG (Mn+Fe)	95-1942
42	MW-002BH (Chloride, Sulphate, TDS, Alk)	95-1943
43	MW-002BI (N/N+COD)	95-1944

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
	6/29	Printed Name RICHARD BURSAW	Printed Name Dennis Browne	
		Signature 	Signature 	
		Printed Name	Printed Name	
		Signature	Signature	
		Printed Name	Printed Name	
		Signature	Signature	

CHAIN OF CUSTODY FORMS

1063

Case Number: _____

Date of Collection: 6/29/95

Site Name and Location

Collected by: Edaphic/Burshaw
R. BurshawLoose Landfill
Tewksbury MATemp
36.5

Item Number

Sample Description

Field Number

Laboratory Number

1	TR-03A; TR-03B (Voa)	95-1963	Triph/unk
2	MW-003BA; MW-003BB (Voa)	95-1964	
3	MW-003BC (SVoa)	95-1965	
4	MW-003BD (PCR)	95-1966	
5	MW-003BE (Metals)	95-1967	
6	MW-003BF (Met Fe)	95-1968	
7	MW-003BG (Cl-Sulfide, TDS, Alkalinity)	95-1969	
8	MW-003BH (N/N; CO ₂)	95-1970	
9	MW-003SA; MW-003SB (Voa)	95-1971	
10	MW-003SC (SVoa)	95-1972	
11	MW-003SD (Metals)	95-1973	
12	MW-003SE (PCR)	95-1974	
13	MW-003SF (Met Fe)	95-1975	
14	MW-003SG (Cl-Sulfide, TDS, Alkalinity)	95-1976	
15	MW-003SH (N/N; CO ₂)	95-1977	

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
	6/29/95	Richard Burshaw	Dennis Brown	
	6/30	<i>[Signature]</i>	<i>[Signature]</i>	

CHAIN OF CUSTODY FORMS

2 of 3

Case Number: _____

Date of Collection: 6/29/95

Site Name and Location

Collected by: B. L. Brown, L. Brown
C. RayburnRaccoon Landfill
Tewksbury, MA
2TEMP
36.5

Item Number

Sample Description

	Field Number	Laboratory Number
16	MW-0035A; MW-0035B (UOA)	95-1978
17	MW-0035 C (SVOA)	95-1979
18	MW-0035 D (PCB)	95-1980
19	MW-0035 E (Metals)	95-1981
20	MW-0035 E (Mn + Fe)	95-1982
21	MW-0035 G (N/N/COO)	95-1983
22	MW-0035 H (Cl ⁻ , Sulfate, MS, Alkalinity)	95-1984
23	MW-007A; MW-007B (UOA)	95-1985
24	MW-007C (SVOA)	95-1986
25	MW-007D (PCB)	95-1987
26	MW-007E1; MW-007E2 (Metals)	95-1988
27	MW-007G1; MW-007G2 (Mn + Fe)	95-1989
28	MW-007H1; MW-007H2 (Cl ⁻ ; Sulfate, MS, TDS)	95-1990
29	MW-007I (N/N, COO)	95-1991

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
	6/29/95	Printed Name RICHARD BROWN	Printed Name BROWN	
	1630	Signature <i>Richard Brown</i>	Signature <i>B. Brown</i>	
		Printed Name	Printed Name	
		Signature	Signature	
		Printed Name	Printed Name	
		Signature	Signature	

CHAIN OF CUSTODY FORMS

30/3

Case Number: _____

Date of Collection: 6/29/75

Site Name and Location

Collected by: B. Bradlow, R. Bensen
C. G. J. J.

Rocco Landfill
Leukemia mt

Item Number

Sample Description

Field Number

Laboratory Number

30

MW-903A · MW-903B (UCA) 95-1992

95-1992

31

MLW-903C SVDC

95 - 1993

32

MLW-903D (Metals)

95-1994

33

AW-903E (M₁ + Fe)

95-1993

34

MW-903F (PCBs)

95-1994

35

MW = 90.36 (Chlorides A.K.T.D.S. Sulph)

95-199

34

MW-9034 / NIN. cov

95-1998

Item Number	Date	Relinquished By	Received By	Purpose of C. of C.
		Printed Name RICHARD BUKSAW	Printed Name D. Browne	
	6/23/75 1630	Signature <i>Richard Buksa</i>	Signature <i>D. Browne</i>	
		Printed Name	Printed Name	
		Signature	Signature	
		Printed Name	Printed Name	
		Signature	Signature	



CHAIN OF CUSTODY FORM

[illegible]

Distribution: Original to Lab. Copy 1 to Field Files, Copy 2 to Project Manager



CHAIN OF CUSTODY FORM

Job/Project Name: <u>80240 Landfill</u>		Job/Project Location: <u>Reverend Hill Testimony</u>		Job/Project Number: <u>07672-0003</u>									
Samplers: (Signatures) <u>C. E. R. R. Bussan</u>		Recorder: (Signature) <u>C. E. R. Bussan</u>		Date: <u>6/30/15</u>									
Lab (Samples Sent To): <u>Ross Analytical</u>		MATRIX		ANALYSIS REQUESTED									
SAMPLING		SAMPLE NUMBER		SAMPLE LOCATION		COMPOSITE/GRAB		PRESERVATIVE (Y/N)		Total # Bags		COMMENTS	
Date	Time			Water	Soil	Landfill Gas							
<u>6/30/15</u>	<u>0915</u>	<u>TB-4</u>											
	<u>1409</u>	<u>LEG-1</u>											
	<u>1224</u>	<u>LEG-2</u>											
	<u>1534</u>	<u>LEG-3</u>											
	<u>1224</u>	<u>LEG-4</u>											
Relinquished By: (Signature) <u>C. E. R. Bussan</u>		Date: <u>6/30/15</u>		Time: <u>1700</u>		Relinquished By: (Signature)		Date:		Time:		Received By: (Signature)	
Relinquished By: (Signature)		Date:		Time:		Relinquished By: (Signature)		Date:		Time:		Received By: (Signature)	
Relinquished By: (Signature)		Date:		Time:		Received for Lab By: (Signature)		Date:		Time:		Comments:	
Method of Shipment: <u>Fed Ex Airbill No 3737492581</u>													

Distribution: Original to Lab. Copy 1 to Field Files. Copy 2 to Project Manager

ATTACHMENT A

Soil and Sediment Sample
CLP Analytical Results
for Rocco's Disposal Area
NUS/FIT October 26, 1989.

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TABLE PAGE 1a OF 1
ROCCO'S DISPOSAL
OCTOBER 26, 1989
CLP VOLATILE ORGANIC ANALYSIS
CASE NO. 12987, SDG NO. A

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TABLE PAGE 10 OF 1
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP VOLATILE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT ANALYTICAL RESULTS (ug/Kg)

Sample Location	SS-10	SS-10R	SS-11	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22634	22636	22636	22637	22638	22638	22640	22638
Traffic Report Number	AR011	AR013	AR012	AR014NE	AR016	AR016	AR017	AR002
Remarks		Replicate	Blank	Background	Background			
Sampling Date	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89
Analysis Date	11/05/89	11/5/89	11/05/89	11/05/89	11/05/89	11/05/89	11/05/89	11/05/89
VOLATILE ORGANIC COMPOUNDS								
Chloroethane								
Bromomethane								
Vinyl Chloride								
Chloroethane								
Methylene Chloride								
Acetone								
Carbon Disulfide								
1,1-Dichloroethane								
1,1-Dichloroethane								
1,2-Dichloroethane (Total)								
Chloroform								
1,2-Dichloroethane								
2-Butanone								
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Vinyl Acetate								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene	4 J							
trans-1,3-Dichloropropene								
Bromoforn								
4-Methyl-2-pentanone								
2-Hexanone								
Tetrachloroethane								
1,1,2,2-Tetrachloroethane								
Toluene	4 J	3 J	10			4 J		
Chlorobenzene	25	18				17		
Ethylbenzene	350 J	200 J	6 J					
Styrene	310	220	16			32		
Total VOC Concentration (ug/Kg)	693 J	441 J	32 J			53 J		

A blank space indicates the volatile organic compound (VOC) was not detected.
 Sample results are reported on a dry weight basis.
 J Quantitation is approximate due to limitations identified during the quality control review.
 Sample Quantitation Limits for the compounds listed above are reported in Attachment Table

TABLE PAGE 18 OF 3
 ROCLO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR005	AR006	AR007	AR008	AR009	AR010
Remarks								
Sampling Date	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89
Extraction Date	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89
Analysis Date	11/29/89	11/29/89	11/29/89	11/29/89	11/29/89	11/29/89	11/29/89	12/07/89
SEMI-VOLATILE COMPOUND								
Phenol								
bis (2-Chloroethyl) ether								
2-Chlorophenol								
1,3-Dichlorobenzene								
1,4-Dichlorobenzene								
Benzyl Alcohol								
1,2-Dichlorobenzene								
2-Methylphenol								
bis (2-Chloroisopropyl) ether								
4-Methylphenol								
N-Nitroso-di-n-propylamine								
Hexachloroethane								
Nitrobenzene								
Isophorone								
2-Nitrophenol								
2,4-Dimethylphenol								
Benzoic acid								
bis (2-Chloroethoxy) methane								
2,4-Dichlorophenol								
1,2,4-Trichlorobenzene								
Naphthalene								
4-Chloroaniline								
Hexachlorobutadiene								
4-Chloro-3-methylphenol								
2-Methylnaphthalene								
Hexachlorocyclopentadiene								
2,4,6-Trichlorophenol								
2,4,5-Trichlorophenol								
2-Chloronaphthalene								
2-Nitroaniline								
Dimethylphthalate								
Acenaphthylene								
2,6-Dinitrotoluene								
	15 J	350 J	47 J			78 J		1400 J
	5 J							710 J
	36 J							

TABLE PAGE 10 OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12887, SOG NO. AR002
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22834	22836	22837	22838	22839	22840	22825
Traffic Report Number	AR011	AR013	AR014	AR016	AR016RE	AR017	AR002
Remarks		Replicate	Background	Background			
Sampling Date	10/28/89	10/28/89	10/28/89	10/28/89	10/28/89	10/28/89	10/28/89
Extraction Date	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89
Analysis Date	12/01/89	12/11/89	12/01/89	12/01/89	12/07/89	12/07/89	11/28/89
SEMI-VOLATILE COMPOUND							
Phenol							
bis (2-Chloroethyl) ether							
2-Chlorophenol							
1,3-Dichlorobenzene							
1,4-Dichlorobenzene							
Benzyl Alcohol							
1,2-Dichlorobenzene							
2-Methylphenol							
bis (2-Chloroisopropyl) ether							
4-Methylphenol							
N-Nitroso-di-n-propylamine							
Hexachloroethane							
Nitrobenzene							
Isophorone							
2-Nitrophenol							
2,4-Dimethylphenol							
Benzoic acid							
bis (2-Chloroethoxy) methane							
2,4-Dichlorophenol							
1,2,4-Trichlorobenzene							
Naphthalene	1300	1600					
4-Chloroaniline							
Hexachlorobutadiene							
4-Chloro-3-methylphenol							
2-Methylnaphthalene	290 J	380 J					
Hexachlorocyclopentadiene							
2,4,6-Trichlorophenol							
2,4,5-Trichlorophenol							
2-Chloronaphthalene							
2-Nitroaniline							
Dimethylphthalate							
Acenaphthylene		64 J					
2,6-Dinitrotoluene							

TABLE PAGE 2a OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG. NO. ARO02
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR006	AR008	AR007	AR008	AR009	AR010
Remarks								
SEMI-VOLATILE COMPOUND								
3-Nitroaniline	19 J	70 J						2300 J
Acenaphthene								
2,4-Dinitrophenol								1300 J
4-Nitrophenol								
Dibenzofuran	10 J	50 J						
2,4-Dinitrotoluene	24 J							
Diethylphthalate								
4-Chlorophenyl-phenylether	23 J	83						2300 J
Fluorene								
4-Nitroaniline								
4,6-Dinitro-2-methylphenol								
N-Nitrosodiphenylamine								
4-Bromophenyl-phenylether								
Hexachlorobenzene								
Pentachlorophenol								
Phenanthrene	380 J	600 J	57 J	52 J	63 J		230 J	17000
Anthracene	420 J	180 J	57 J					5000
Di-n-butylphthalate	7 J							
Fluoranthene	780 J	760 J	140 J	140 J	170 J		300 J	24000
Pyrene	24 J	810 J	130 J	130 J	140 J		320 J	29000
Butylbenzylphthalate	23 J						69 J	480 J
3,3'-Dichlorobenzidine								
Benzo(a)anthracene	360 J	370 J	76 J	81 J	83 J		140 J	10000
Chrysene	380 J	380 J	80 J	81 J	83 J		150 J	11000
bis(2-Ethylhexyl)phthalate	27 J	180 J		370 J	490 J		1200 J	760 J
Di-n-octyl phthalate				54 J	78 J		180 J	
Benzo(b)fluoranthene	660	420	96 J	110 J	93 J		200 J	12000
Benzo(k)fluoranthene	780	310 J	86 J	110 J	83 J		110 J	6800
Benzo(a)pyrene	270 J	370 J	82 J	89 J	87 J		150 J	9500
Indeno (1,2,3-cd)pyrene	130 J	250 J	60 J	55 J				5200
Dibenz(a,h)anthracene								780 J
Benzo(a,h,i)perylene	110 J	240 J		51 J			130 J	4700

TABLE PAGE 2b OF 3

ROCCO'S DISPOSAL
OCTOBER 26, 1989
CLP EXTRACTABLE ORGANIC ANALYSIS
CASE NO. 12987, SDG. NO. AR002
SOIL AND SEDIMENT ANALYTICAL RESULTS
(ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22634	22635	22637	22638	22639	22640	22625
Traffic Report Number	AR011	AR013	AR014	AR015	AR016RE	AR017	AR002
Remarks		Replicate	Background	Background			
SEMI-VOLATILE COMPOUND							
3-Nitroaniline							
Acenaphthene	530 J	720					
2,4-Dinitrophenol							
4-Nitrophenol							
Dibenzofuran	310 J	310 J					
2,4-Dinitrotoluene							
Diethylphthalate							
4-Chlorophenyl phenylether							
Fluorene	250 J	330 J					
4-Nitroaniline							
4,6-Dinitro-2-methylphenol							
N-Nitrosodiphenylamine							
4-Bromophenyl phenylether							
Hexachlorobenzene							
Pentachlorophenol							
Phenanthrene	670 J	760					200 J
Anthracene	130 J	110 J					49 J
Di-n-butylphthalate					48 J		
Fluoranthene	940	860			58 J		280 J
Pyrene	1100	170 J					200 J
Butylbenzylphthalate							
3,3'-Dichlorobenzidine							
Benzo(a)anthracene	410 J	370 J					100 J
Chrysene	440 J	430 J					110 J
Bis(2-Ethylhexyl)phthalate	9400	2300					41 J
Di-n-octyl phthalate	2600	220 J					
Benzo(b)fluoranthene	800 J	430 J					87 J
Benzo(k)fluoranthene	360 J	320 J					85 J
Benzo(a)pyrene	430 J	350 J					80 J
Indeno (1,2,3-cd)pyrene	220 J	280 J					
Dibenz(a,h)anthracene							
Benzo(g,h,i)perylene	130 J	270 J					

TABLE PAGE 3b OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SS-01	SS-02	SS-03
Sample Number	22634	22636	22637	22638	22639	22640	22625
Traffic Report Number	AR011	AR013	AR014	AR016	AR018	AR017	AR002
Remarks		Replicate	Background	Background			
Sampling Date	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89	10/26/89
Extraction Date	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89	11/04/89
Analyse Date	12/08/89	12/08/89	12/08/89	12/08/89	12/08/89	12/08/89	12/08/89
PESTICIDE/PCB COMPOUND							
alpha-BHC							
beta-BHC							
delta-BHC							
gamma-BHC (Lindane)							
Heptachlor							
Aldrin							
Heptachlor epoxide							
Endosulfan I							
Dielskin							
1,4'-DDE							
Endrin							
Endosulfan II							7.9 J
4,4'-DDD							
Endosulfan sulfate							
4,4'-DDT							
Methoxychlor							
Endrin ketone							
alpha-Chlordane							
gamma-Chlordane							
Toxaphene							
Aroclor-1016							
Aroclor-1221							
Aroclor-1232							
Aroclor-1242							
Aroclor-1248							
Aroclor-1254							
Aroclor-1260							

A blank space indicates the compound was not detected.
 Sample results are reported on a dry weight basis.
 Quantitation is approximate due to limitations identified during the quality control review.
 J
 Sample Quantitation Limits for the compounds listed above are reported in Attachment Table .

Table Page 1a of 1
 ROCCO'S DISPOSAL AREA
 October 26, 1989
 CLP INORGANIC ANALYSIS
 CASE NO. 12087, SDG NO. MAN112
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (mg/kg)

Sample Location	35-02	35-03	35-04	35-05	35-06	35-07	35-08	35-09
Sample Number	22826	22827	22828	22829	22830	22831	22832	22833
Traffic Report Number	MAN113	MAN114	MAN115	MAN116	MAN117	MAN118	MAN119	MAN120
Remarks								
Inorganic Elements								
Aluminum	10300.00	4100.00	3780.00	5430.00	3510.00	4550.00	6190.00	10700.00
Antimony								
Arsenic	17.80	14.30	42.40 J	11.90	8.50			16.80 J
Barium	22.40	1.20	22.60	15.50	34.30	8.00 J	23.90	167.00
Beryllium								
Cadmium	3450.00 J	3100.00	4410.00 J	1110.00 J	858.00 J	1360.00 J	1710.00 J	19700.00 J
Calcium	28.80	10.90	798.00	11.90	11.00	8.50	17.10	25.40
Chromium	10.80	3.10 J	3.30 J	3.80	3.10 J		3.50 J	11.60
Cobalt	23.90 J	1.20 J	27.90 J	9.00 J	39.70 J	2.50 J	27.90 J	58.90 J
Copper	21900.00	7090.00	7620.00	5470.00	6680.00	2880.00	6170.00	25000.00
Iron	34.90	126.30	37.90	8.90	371.00	1.70	49.90	325.00
Lead	4060.00	1990.00	1160.00	1590.00	1240.00	1040.00	1530.00	4610.00
Magnesium	458.00 J	197.10 J	50.00 J	59.50 J	48.40 J	79.80 J	50.90 J	305.00 J
Manganese								
Mercury								0.23
Nickel	11.40 J	490.00 J	10.00 J	10.00 J	7.90 J			59.60
Potassium	714.00 J			803.00	227.00 J		334.00 J	2660.00
Selenium	2.60 J							
Silver								
Sodium	249.00	139.00	34.80 J	52.20	39.00	194.00	79.70	516.00
Thallium								
Vanadium	28.40	9.60	11.30	10.90	7.60	6.20	12.30	275.00
Zinc	76.60 J	34.90 J	129.00 J	24.90 J	44.00 J	NA	87.60 J	188.00 J
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

Table Page 1b of 1
 ROCCO'S DISPOSAL AREA
 October 26, 1989
 CLP INORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. MAN112
 SOIL AND SEDIMENT ANALYTICAL RESULTS
 (mg/kg)

Sample Location	SS-10	SS-100	SS-12	SS-13	SO-01	SO-02	SO-03
Sample Number	22634	22635	22637	22638	22639	22640	22625
Traffic Report Number	MAN121	MAN123	MAN124	MAN125	MAN126	MAN122	MAN112
Remarks			Background	Background			
Inorganic Elements							
Aluminum	9880.00	9790.00	8880.00	8880.00	3320.00	4190.00	3240.00
Antimony							
Arsenic	17.50	14.50	10.70	11.40 J	7.00	8.90	13.00 J
Barium	47.90	48.70	9.00	6.20	15.30	9.60	12.60
Beryllium							
Cadmium							
Calcium	1750.00 J	3440.00 J	184.00 J	263.00 J	3320.00 J	652.00 J	1080.00 J
Chromium	31.70	29.90	7.00	8.00	8.10	9.90	8.00
Cobalt	7.80	7.60	1.50 J	3.50 J	2.40 J	2.70 J	3.40 J
Copper	32.30 J	134.00	3.20 J	2.40 J	8.00 J	4.00 J	31.30 J
Iron	10400.00	11400.00	4790.00	4200.00	6110.00	4500.00	4600.00
Lead	143.00	139.00	8.10	1.40	25.10	2.90	18.00
Magnesium	2940.00	280.00	765.00	1160.00	1160.00	1590.00	1150.00
Manganese	98.80 J	151.00 J	89.10 J	45.90 J	82.00 J	77.60 J	46.10 J
Mercury							
Nickel	20.30	17.40		263.00 J	6.60 J		
Potassium	1160.00 J	1500.00 J		R	R	R	R
Selenium	1.50 J						
Silver							
Sodium	177.00	198.00			70.00	77.10	45.00
Thallium							
Vanadium	25.20	23.20	9.30	7.10	7.30	7.70	7.60
Zinc	234.00 J	168.00 J	NA	NA	NA	NA	25.70 J
Cyanide	NA	NA	NA	NA	NA	NA	NA

NOTE:

A blank space indicates the element was not detected.
 Sample results are reported on a dry weight basis.
 Quantitation is approximate due to limitations identified in the quality control review.
 J Value is rejected.
 NA Not Analyzed

Sample Detection Limits for the elements listed above are reported in Attachment Table

ATTACHMENT B

Soil and Sediment Sample
Detection Limits
for Rocco's Disposal Area,
NUS/FIT October 26, 1984.

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TABLE PAGE 1a OF 1
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP VOLATILE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTIFICATION LIMITS (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR005	AR006	AR007	AR008RE	AR009	AR010
Remarks								
VOLATILE ORGANIC COMPOUND								
Chloromethane	24	18	21	19	18	21	24	67
Bromomethane	24	18	21	19	18	21	24	67
Vinyl Chloride	24	18	21	19	18	21	24	67
Chloroethane	24	18	21	19	18	21	24	67
Methylene Chloride	24	51	21	19	18	21	24	67
Acetone	12	9	10	9	9	11	12	33
Carbon Disulfide	12	9	10	9	9	11	12	33
1,1-Dichloroethane	12	9	10	9	9	11	12	33
1,1-Dichloroethane (Total)	12	9	10	9	9	11	12	33
1,2-Dichloroethane	12	9	10	9	9	11	12	33
Chloroform	12	9	10	9	9	11	12	33
1,2-Dichloroethane	12	18	21	19	18	21	24	67
2-Butanone	12	9	10	9	9	11	12	33
1,1,1-Trichloroethane	12	9	10	9	9	11	12	33
Carbon Tetrachloride	12	18	21	19	18	21	24	67
Vinyl Acetate	12	9	10	9	9	11	12	33
Bromodichloromethane	12	9	10	9	9	11	12	33
1,2-Dichloropropane	12	9	10	9	9	11	12	33
cis-1,3-Dichloropropene	12	9	10	9	9	11	12	33
Trichloroethane	12	9	10	9	9	11	12	33
Dibromochloromethane	12	9	10	9	9	11	12	33
1,1,2-Trichloroethane	12	9	10	9	9	11	12	33
Benzene	12	9	10	9	9	11	12	33
trans-1,3-Dichloropropene	12	9	10	9	9	11	12	33
Bromoform	12	9	10	9	9	11	12	33
4-Methyl-2-pentanone	24	18	21	19	18	21	24	67
2-Hexanone	24	18	21	19	18	21	24	67
Tetrachloroethane	12	9	10	9	9	11	12	33
1,1,2,2-Tetrachloroethane	12	9	10	9	9	11	12	33
Toluene	12	9	10	9	9	11	12	33
Chlorobenzene	12	9	10	9	9	11	12	33
Ethylbenzene	12	9	10	9	9	11	12	33
Styrene	12	9	10	9	9	11	12	33
Xylene (Total)	12	9	10	9	9	11	12	33

TABLE PAGE 10 OF 1

ROCCO'S DISPOSAL
OCTOBER 26, 1989

CLP VOLATILE ORGANIC ANALYSIS
CASE NO. 12887, SDG NO. AR002

SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS (ug/Kg)

Sample Location	SS-10	SS-10R	SS-11	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22834	22835	22836	22837	22838	22839	22840	22825
Traffic Report Number	AR011	AR013	AR012	AR014RE	AR015	AR016	AR017	AR002
Remarks		Replicate	Blank	Background	Background			
VOLATILE ORGANIC COMPOUND								
Chloromethane	19	24	17	19	19	21	26	20 UJ
Bromomethane	19	24	17	19	19	21	26	20 UJ
Vinyl Chloride	19	24	17	19	19	21	26	20 UJ
Chloroethane	19	24	21	19	22	30	21	10 UJ
Methylene Chloride	42	38	24	19	19	10	26	20 UJ
Acetone	10	12	8	9	9	10	13	10 UJ
Carbon Disulfide	10	12	8	9	9	10	13	10 UJ
1,1-Dichloroethane	10	12	8	9	9	10	13	10 UJ
1,1-Dichloroethane	10	12	8	9	9	10	13	10 UJ
1,2-Dichloroethane (Total)	10	12	8	9	9	10	13	10 UJ
Chloroform	10	12	8	9	9	10	13	10 UJ
1,2-Dichloroethane	10	12	8	9	9	10	13	10 UJ
2-Butanone	10	12	8	9	9	10	13	10 UJ
1,1,1-Trichloroethane	10	12	8	9	9	10	13	10
Carbon Tetrachloride	10	12	8	9	9	10	13	10
Vinyl Acetate	10	12	8	9	9	10	13	10
Bromodichloromethane	10	12	8	9	9	10	13	10
1,2-Dichloropropane	10	12	8	9	9	10	13	10
cis-1,3-Dichloropropene	10	12	8	9	9	10	13	10
Trichloroethane	10	12	8	9	9	10	13	10
Dibromochloromethane	10	12	8	9	9	10	13	10
1,1,2-Trichloroethane	10	12	8	9	9	10	13	10
Benzene	10	12	8	9	9	10	13	10
trans-1,3-Dichloropropene	10	12	8	9	9	10	13	10
Bromoform	10	12	8	9	9	10	13	10
4-Methyl-2-pentanone	10	12	8	9	9	10	13	10
2-Hexanone	10	12	8	9	9	10	13	10
Tetrachloroethane	10	12	8	9	9	10	13	10
1,1,2,2-Tetrachloroethane	10	12	8	9	9	10	13	10
Toluene	10	12	8	9	9	10	13	10
Chlorobenzene	10	12	8	9	9	10	13	10
Ethylbenzene	10	12	8	9	9	10	13	10
Styrene	10	12	8	9	9	10	13	10
Xylene (Total)	10	12	8	9	9	10	13	10

Sample Detection Limits are reported on a dry weight basis.

UJ Quantitation limit is approximated due to limitations during the quality control review.

TABLE PAGE 1a OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR005	AR006	AR007	AR008	AR009	AR010
Remarks								
SEMI-VOLATILE COMPOUND								
Phenol	480	380	410	390	370	510	460	4200
bis (2-Chloroethoxy) ether	480	380	410	390	370	510	460	4200
2-Chlorophenol	480	380	410	390	370	510	460	4200
1,3-Dichlorobenzene	480	380	410	390	370	510	460	4200
1,4-Dichlorobenzene	480	380	410	390	370	510	460	4200
Benzyl Alcohol	480	380	410	390	370	510	460	4200
1,2-Dichlorobenzene	480	380	410	390	370	510	460	4200
2-Methylphenol	480	380	410	390	370	510	460	4200
bis (2-Chloroisopropyl) ether	480	380	410	390	370	510	460	4200
4-Methylphenol	480	380	410	390	370	510	460	4200
N-Nitroso-di-n-propylamine	480	380	410	390	370	510	460	4200
Hexachloroethane	480	380	410	390	370	510	460	4200
Nitrobenzene	480	380	410	390	370	510	460	4200
Isophorone	480	380	410	390	370	510	460	4200
2-Nitrophenol	480	380	410	390	370	510	460	4200
2,4-Dimethylphenol	480	380	410	390	370	510	460	4200
Benzoic acid	2300	1800	2000	1900	1800	2500	2300	21000
bis (2-Chloroethoxy) methane	480	380	410	390	370	510	460	4200
2,4-Dichlorophenol	480	380	410	390	370	510	460	4200
1,2,4-Trichlorobenzene	480	380	410	390	370	510	460	4200
Naphthalene	480	380	410	390	370	510	460	4200
4-Chloroaniline	480	380	410	390	370	510	460	4200
Hexachlorobutadiene	480	380	410	390	370	510	460	4200
4-Chloro-3-methylphenol	480	380	410	390	370	510	460	4200
2-Methylnaphthalene	480	380	410	390	370	510	460	4200
Hexachlorocyclopentadiene	480	380	410	390	370	510	460	4200
2,4,6-Trichlorophenol	480	380	410	390	370	510	460	4200
2,4,5-Trichlorophenol	2300	1800	2000	1900	1800	2500	2300	21000
2-Chloronaphthalene	480	380	410	390	370	510	460	4200
2-Nitroaniline	2300	1800	2000	1900	1800	2500	2300	21000
Dimethylphthalate	480	380	410	390	370	510	460	4200
Acenaphthylene	480	380	410	390	370	510	460	4200
2,6-Dinitrotoluene	480	380	410	390	370	510	460	4200

TABLE PAGE 10 OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12887, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22634	22635	22637	22638	22639	22640	22625
Traffic Report Number	AR011	AR013	AR014	AR015	AR016RE	AR017	AR002
Remarks		Replicate	Background	Background			
SEMI-VOLATILE COMPOUND							
Phenol	800	480	390	400	430	530	400
bis (2-Chloroethyl) ether	800	480	390	400	430	530	400
2-Chlorophenol	800	480	390	400	430	530	400
1,3-Dichlorobenzene	800	480	390	400	430	530	400
1,4-Dichlorobenzene	800	480	390	400	430	530	400
Benzyl Alcohol	800	480	390	400	430	530	400
1,2-Dichlorobenzene	800	480	390	400	430	530	400
2-Methylphenol	800	480	390	400	430	530	400
bis (2-Chloroisopropyl) ether	800	480	390	400	430	530	400
4-Methylphenol	800	480	390	400	430	530	400
N-Nitrosodi-n-propylamine	800	480	390	400	430	530	400
Hexachloroethene	800	480	390	400	430	530	400
Nitrobenzene	800	480	390	400	430	530	400
Isophorone	800	480	390	400	430	530	400
2-Nitrophenol	800	480	390	400	430	530	400
2,4-Dimethylphenol	800	480	390	400	430	530	400
Benzoic acid	3900	2400	1900	1900	2100	2600	1900
bis (2-Chloroethoxy) methane	800	480	390	400	430	530	400
2,4-Dichlorophenol	800	480	390	400	430	530	400
1,2,4-Trichlorobenzene	800	480	390	400	430	530	400
Naphthalene	800	480	390	400	430	530	400
4-Chloroaniline	800	480	390	400	430	530	400
Hexachlorobutadiene	800	480	390	400	430	530	400
4-Chloro-3-methylphenol	800	480	390	400	430	530	400
2-Methylnaphthalene	800	480	390	400	430	530	400
Hexachlorocyclopentadiene	800	480	390	400	430	530	400
2,4,6-Trichlorophenol	800	480	390	400	430	530	400
2,4,5-Trichlorophenol	3900	2400	1900	1900	2100	2600	1900
2-Chloronaphthalene	800	480	390	400	430	530	400
2-Nitroaniline	3900	2400	1900	1900	2100	2600	1900
Dimethylphthalate	800	480	390	400	430	530	400
Acenaphthylene	800	480	390	400	430	530	400
2,6-Dinitrotoluene	800	480	390	400	430	530	400

TABLE PAGE 2a OF 3
 ROCCO'S DISPOSAL
 OCTOBER 28, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR005	AR006	AR007	AR008	AR009	AR010
Remarks								
SEMI-VOLATILE COMPOUND								
3-Nitroaniline	2300	1800	2000	1900	1800	2500	2300	21000
Acenaphthene	410	380	410	390	370	510	460	4200
2,4-Dinitrophenol	2300	1800	2000	1900	1800	2500	2300	21000
4-Nitrophenol	2300	1800	2000	1900	1800	2500	2300	21000
Dibenzofuran	480	380	410	390	370	510	460	4200
2,4-Dinitrotoluene	2300	1800	2000	1900	1800	2500	2300	21000
Diethylphthalate	480	380	410	390	370	510	460	4200
4-Chlorophenyl-phenylether	480	380	410	390	370	510	460	4200
Fluorene	480	380	410	390	370	510	460	4200
4-Nitroaniline	2300	1800	2000	1900	1800	2500	2300	21000
4,6-Dinitro-2-methylphenol	2300	1800	2000	1900	1800	2500	2300	21000
N-Nitrosodiphenylamine	480	380	410	390	370	510	460	4200
4-Bromophenyl-phenylether	480	380	410	390	370	510	460	4200
Hexachlorobenzene	480	380	410	390	370	510	460	4200
Pentachlorophenol	480	380	410	390	370	510	460	4200
Phenanthrene	480	380	410	390	370	510	460	4200
Anthracene	480	380	410	390	370	510	460	4200
Di-n-butylphthalate	480	380	410	390	370	510	460	4200
Fluoranthene	480	380	410	390	370	510	460	4200
Pyrene	480	380	410	390	370	510	460	4200
Butylbenzylphthalate	480	380	410	390	370	510	460	4200
3,3'-Dichlorobenzidine	950	750	830	780	740	1000	930	8500
Benzo(a)anthracene	480	380	410	390	370	510	460	4200
Chrysene	480	380	410	390	370	510	460	4200
Bis(2-Ethylhexyl)phthalate	480	380	410	390	370	510	460	4200
Di-n-octyl phthalate	480	380	410	390	370	510	460	4200
Benzo(b)fluoranthene	480	380	410	390	370	510	460	4200
Benzo(k)fluoranthene	480	380	410	390	370	510	460	4200
Benzo(a)pyrene	480	380	410	390	370	510	460	4200
Indeno (1,2,3-cd)pyrene	480	380	410	390	370	510	460	4200
Dibenz(a,h)anthracene	480	380	410	390	370	510	460	4200
Benzo(g,h,i)perylene	480	380	410	390	370	510	460	4200

TABLE PAGE 2U OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12887, SDO NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22834	22835	22837	22838	22839	22840	22825
Traffic Report Number	AR011	AR013	AR014	AR015	AR016R	AR017	AR002
Remarks		Replicate	Background	Background			
SEMI-VOLATILE COMPOUND							
3-Nitroaniline	3900	2400	1900	1900	2100	2600	1900
Acenaphthene	800	480	390	400	430	530	400
2,4-Dinitrophenol	3900	2400	1900	1900	2100	2600	1900
4-Nitrophenol	3900	2400	390	400	430	530	400
Dibenzofuran	800	480	390	400	430	530	400
2,4-Dinitrotoluene	3900	2400	390	400	430	530	400
Diethylphthalate	800	480	390	400	430	530	400
4-Chlorophenyl-phenylether	800	480	390	400	430	530	400
Fluorene	3900	2400	1900	1900	2100	2600	1900
4-Nitroaniline	3900	2400	1900	1900	2100	2600	1900
4,6-Dinitro-2-methylphenol	800	480	390	400	430	530	400
N-Nitrosodiphenylamine	800	480	390	400	430	530	400
4-Bromophenyl-phenylether	800	480	390	400	430	530	400
Hexachlorobenzene	800	480	1900	1900	2100	2600	1900
Pentachlorophenol	800	480	390	400	430	530	400
Phenanthrene	800	480	390	400	430	530	400
Anthracene	800	480	390	400	430	530	400
Di-n-butylphthalate	800	480	390	400	430	530	400
Fluoranthene	800	480	390	400	430	530	400
Pyrene	800	480	390	400	430	530	400
Butylbenzylphthalate	800	480	390	400	430	530	400
3,3'-Dichlorobenzidine	1600	970	770	790	860	1100	800
Benzo(a)anthracene	800	480	390	400	430	530	400
Chrysene	800	480	390	400	430	530	400
Bis(2-Ethylhexyl)phthalate	800	480	390	400	430	530	400
Di-n-octyl phthalate	800	480	390	400	430	530	400
Benzo(b)fluoranthene	800	480	390	400	430	530	400
Benzo(k)fluoranthene	800	480	390	400	430	530	400
Benzo(a)pyrene	800	480	390	400	430	530	400
Indeno(1,2,3-cd)pyrene	800	480	390	400	430	530	400
Dibenz(a,h)anthracene	800	480	390	400	430	530	400
Benzo(g,h,i)perylene	800	480	390	400	430	530	400

TABLE PAGE 3a OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12987, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22626	22627	22628	22629	22630	22631	22632	22633
Traffic Report Number	AR003	AR004	AR005	AR006	AR007	AR008	AR009	AR010
Remarks								
PESTICIDE/PCB COMPOUND								
alpha-BHC	67.0	46.0	20.0	47.0	18.0	12.0	56.0	20.0
beta-BHC	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
delta-BHC	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
gamma-BHC (Lindane)	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
Heptachlor	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
Aldrin	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
Heptachlor epoxide	57.0	45.0	20.0	47.0	18.0	12.0	56.0	20.0
Endosulfan I	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
Dielsdorf	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
4,4'-DDE	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
Endrin	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
Endosulfan II	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
4,4'-DDD	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
Endosulfan sulfate	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
4,4'-DDT	110.0	90.0	40.0	93.0	36.0	25.0	110.0	41.0
Methoxychlor	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Endrin ketone	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
alpha-Chlordane	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
gamma-Chlordane	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Toxaphene	1100.0	900.0	400.0	930.0	360.0	250.0	1100.0	410.0
Aroclor-1016	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Aroclor-1221	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Aroclor-1232	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Aroclor-1242	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Aroclor-1248	570.0	450.0	200.0	470.0	180.0	120.0	560.0	200.0
Aroclor-1254	1100.0	900.0	400.0	930.0	360.0	250.0	1100.0	410.0
Aroclor-1260	1100.0	900.0	400.0	930.0	360.0	250.0	1100.0	410.0

TABLE PAGE 3b OF 3
 ROCCO'S DISPOSAL
 OCTOBER 26, 1989
 CLP EXTRACTABLE ORGANIC ANALYSIS
 CASE NO. 12887, SDG NO. AR002
 SOIL AND SEDIMENT SAMPLE QUANTITATION LIMITS
 (ug/kg)

Sample Location	SS-10	SS-10R	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22634	22635	22637	22638	22639	22640	22625
Traffic Report Number	AR011	AR013	AR014	AR015	AR016	AR017	AR002
Remarks		Replicate	Background	Background			
PESTICIDE/PCB COMPOUND							
alpha-BHC	19.0	120.0	9.2	9.5	21.0	13.0	19.0
beta-BHC	19.0	120.0	9.2	9.5	21.0	13.0	19.0
delta-BHC	19.0	120.0	9.2	9.5	21.0	13.0	19.0
gamma-BHC (Lindane)	19.0	120.0	9.2	9.5	21.0	13.0	19.0
Heptachlor	19.0	120.0	9.2	9.5	21.0	13.0	19.0
Aldrin	19.0	120.0	9.2	9.5	21.0	13.0	19.0
Heptachlor epoxide	19.0	120.0	9.2	9.5	21.0	13.0	19.0
Endosulfan I	38.0	230.0	18.0	19.0	41.0	26.0	38.0
Dieldrin	38.0	230.0	18.0	19.0	41.0	26.0	38.0
4,4'-DDE	38.0	230.0	18.0	19.0	41.0	26.0	38.0
Endrin	38.0	230.0	18.0	19.0	41.0	26.0	38.0
Endosulfan II	38.0	230.0	18.0	19.0	41.0	26.0	38.0
4,4'-DDD	38.0	230.0	18.0	19.0	41.0	26.0	38.0
Endosulfan sulfate	38.0	230.0	18.0	19.0	41.0	26.0	38.0
4,4'-DDT	38.0	230.0	18.0	19.0	41.0	26.0	38.0
Methoxychlor	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Endrin ketone	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
alpha-Chlordane	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
gamma-Chlordane	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Toxaphene	380.0	2300.0	180.0	190.0	410.0	260.0	380.0
Aroclor-1016	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Aroclor-1221	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Aroclor-1232	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Aroclor-1242	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Aroclor-1248	190.0	1200.0	92.0	95.0	210.0	130.0	190.0
Aroclor-1254	380.0	2300.0	180.0	190.0	410.0	260.0	380.0
Aroclor-1260	380.0	2300.0	180.0	190.0	410.0	260.0	380.0

Sample Quantitation Limits are reported on dry weight basis.

UJ Sample Quantitation Limit is approximate due to limitations identified during the quality control review.

TABLE Page 1a of 1
 ROCCO'S DISPOSAL AREA
 OCTOBER 26, 1989
 CLP INORGANIC ANALYSIS
 CASE NO. 12987, SDG. NO. MAN112
 SOIL AND SEDIMENT SAMPLE DETECTION LIMITS
 (mg/Kg)

Sample Location	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07	SS-08	SS-09
Sample Number	22826	22827	22828	22829	22830	22831	22832	22833
Traffic Report Number	MAN113	MAN114	MAN115	MAN116	MAN117	MAN118	MAN119	MAN120
Remarks								
Percent Solids	88.3%	81.2%	78.2%	87.9%	88.0%	73.9%	72.1%	75.1%
Inorganic Elements								
Instrument Detection Limits (ug/g)								
Aluminum	53.00	2.81	13.30	11.63	11.62	14.07	14.42	13.85
Antimony	36.00	9.36	9.72	8.85	8.64	10.28	10.54	10.12
Arsenic	4.00	0.99	1.02	0.91	0.91	1.08	1.11	1.07
Barium	20.00	4.93	5.12	4.55	4.55	5.41	5.55	5.33
Beryllium	1.00	0.25	0.26	0.33	0.23	0.27	0.40	1.70
Cadmium	5.00	1.13	1.26	1.14	1.14	1.35	1.39	1.33
Calcium	63.00	15.52	16.11	14.33	14.32	17.05	17.48	16.78
Chromium	8.00	1.23	1.26	1.14	1.14	1.35	1.39	1.33
Cobalt	6.00	1.48	1.53	1.37	1.36	1.62	1.66	1.60
Copper	9.00	2.25	2.30	2.05	2.05	2.44	2.50	2.40
Iron	14.00	3.45	3.68	3.18	3.18	3.79	3.88	3.73
Lead	1.00	0.25	0.26	0.23	0.23	0.27	0.28	0.27
Magnesium	116.00	28.57	29.67	26.39	26.36	31.39	32.18	30.89
Manganese	4.00	0.99	1.02	0.91	0.91	1.08	1.11	1.07
Mercury	0.20	0.12	0.13	0.11	0.11	0.14	0.14	0.14
Nickel	26.00	6.46	6.65	5.92	5.92	7.04	7.21	6.92
Potassium	918.00	226.11	234.78	208.57	227.00	248.44	334.00	244.47
Selenium	2.00	0.48	0.51	0.46	0.45	0.54	0.55	0.53
Silver	6.00	19.95	20.72	18.43	18.41	11.92	22.47	21.57
Sodium	81.00	0.48	0.51	0.46	0.45	0.54	0.55	0.53
Thallium	2.00	1.48	1.53	1.37	1.37	1.62	1.66	1.60
Vanadium	6.00	1.48	1.53	1.37	1.37	1.62	1.66	1.60
Zinc	6.00	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA

TABLE Page 1b of 1
 ROCCO'S DISPOSAL AREA
 OCTOBER 26, 1989
 CLP INORGANIC ANALYSIS
 CASE NO. 12987, SOG. NO. MAN112
 SOIL AND SEDIMENT SAMPLE DETECTION LIMITS
 (mg/Kg)

Sample Location	SS-10	SS-10D	SS-12	SS-13	SD-01	SD-02	SD-03
Sample Number	22634	22635	22637	22638	22639	22640	22636
Traffic Report Number	MAN121	MAN123	MAN124	MAN126	MAN126	MAN122	MAN112
Remarks							
Percent Solids	73.7%	70.7%	88.4%	82.6%	81.6%	71.0%	69.3%
Inorganic Elements							
	Instrument Detection Limits (ug/L)						
Aluminum	11.1	14.71	11.76	12.65	12.76	14.65	15.01
Antimony	10.31	10.75	8.60	9.17	9.31	10.70	10.97
Arsenic	1.03	1.13	0.90	0.97	0.98	1.13	1.15
Barium	5.33	5.66	4.52	6.20	4.90	9.60	5.77
Beryllium	0.50	0.52	0.30	0.24	0.25	0.28	0.29
Cadmium	1.36	1.41	1.13	1.21	1.23	1.41	1.44
Calcium	17.12	17.92	14.25	16.20	16.44	17.76	18.18
Chromium	1.36	1.41	1.13	1.21	1.23	1.41	1.44
Cobalt	1.70	1.70	1.50	1.45	2.40	2.70	1.73
Copper	2.44	2.55	2.04	2.17	2.21	2.54	2.60
Iron	3.50	3.98	3.17	3.38	3.43	3.84	4.04
Lead	0.27	0.28	0.23	0.24	0.25	0.28	0.29
Magnesium	31.45	32.11	26.24	27.99	28.43	32.68	33.48
Manganese	1.05	1.13	0.90	0.97	0.98	1.13	1.15
Mercury	0.14	0.14	0.14	0.12	0.12	0.14	0.14
Nickel	7.06	7.36	5.86	6.27	6.60	7.32	7.50
Potassium	249.12	269.76	207.69	208.00	225.00	285.59	284.94
Selenium	0.64	0.67	0.48	0.49	0.49	0.66	0.66
Silver	21.98	22.91	18.33	19.84	19.83	22.82	45.00
Sodium	0.54	0.57	0.45	0.48	0.49	0.56	0.58
Thallium	1.63	1.70	1.26	1.45	1.47	1.69	1.73
Vanadium	1.63	1.70	1.26	1.45	1.47	1.69	1.73
Zinc	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA

NOTE: Sample Detection Limits are reported on a dry weight basis.
 UJ The detection limit is approximated due to limitations identified in the quality control review.
 R Value is rejected.
 NA Not Analyzed

ATTACHMENT C

Leachate Sample NUS/FIT
Volatile Organic Screening Program
Analytical Results
Detection Limits
for Rocco's Disposal Area,
NUS/FIT October 26, 1989.

DRAFT

TABLE # _____ Page _____ of _____
 SITE NAME: ROCCO'S DISPOSAL AREA
 SAMPLING DATE: OCTOBER 26, 1989
 NUS/FIT VOLATILE ORGANIC SCREENING
 LEACHATE ANALYTICAL RESULTS
 (ppb)

Sample Location	LS-01	LS-02	LS-03	LS-04	LS-05	LS-06
Sample Number	22641b	22642	22643	22644	22645	22625
Remarks					BLANK	
Tentatively Identified Compound						
1,1-Dichloroethene						
trans-1,2-Dichloroethene						
cis-1,2-Dichloroethene						
1,1,1-Trichloroethane						
Benzene						
Trichloroethene						
Toluene						
Tetrachloroethene						
Chlorobenzene						
Ethylbenzene						
m-Xylene						
o-Xylene						
No. of Unidentified Peaks	6	1	1	0	1	1

A blank space indicates the compound was not detected.

ppb

Parts per billion

NA Compound not analyzed

IDL Instrument Detection Limit

BQL Compound is detected above the IDL but less than the reliable quantitation limit.

NOTR: The above results are from a NUS/FIT headspace screening technique using a Photovac 10A 10 or 10S30 Gas Chromatograph. Reported data are semi-quantitative and indicate the presence of compounds. Concentrations must be interpreted as plus or minus a 40% range.
 a Due to matrix interference, these are the lowest achievable detection limits for this sample.
 b Sample analyzed 11/1/89 with soil samples. Raw data included in soils package.

December 1991



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date March 25, 1992

From Chief, TSS, ERCB, DHAC, ATSDR (E-32)

Subject Health Consultation: Rocco's Landfill Site (A106), Middlesex
County, Tewksbury, Massachusetts

To Louise House
ATSDR Regional Representative
EPA Region I

Through: Director, DHAC, ATSDR (E-32) *[Signature]*
Chief, ERCB, DHAC, ATSDR (E-32) *[Signature]*

BACKGROUND AND STATEMENT OF ISSUES

The Agency for Toxic Substances and Disease Registry (ATSDR) was requested by the Environmental Protection Agency (EPA) to determine if current conditions at the Rocco's Landfill Site (RLS) represent an immediate health and safety threat to the community and particularly to those that gain access to the site for recreational or other purposes [1]. This consultation will serve only as an assessment of potential current hazards and threats posed by the site and is not intended to be used as a comprehensive health impact evaluation from any past or potential future exposures. The ATSDR has received a petition from the community to conduct a Public Health Assessment related to the RLS and is in the process of evaluating whether or not to accept the petition on the basis of established criteria which are necessary to adequately complete such an Assessment [2]. As part of that evaluation, ATSDR has conducted a site visit and gathered information on health concerns from members of the community [3,4]. A response to the petition request is expected in the near future.

The RLS encompasses approximately 100-acres; 50 acres of which is occupied by three former landfill areas or lobes (Attachment 1). The landfills reportedly received unknown quantities of municipal, commercial, and industrial wastes from Tewksbury from 1957 to the early or mid 1980s. Each lobe is reported to be about 100 to 150 feet high [3,5]. Currently, no containment, liners, or engineering covers are in place [3,5]. Pedestrian and vehicular traffic is not restricted and observations made during the site visit confirm that areas of the site are used by local residents, probably children or adolescents, for recreation [4,5]. Steep slopes and ditches, heavy growth of tall grasses, thickets, brush, briar and pricker bushes reportedly dominate the landfill areas [3-5]. Protruding metal objects were also observed [4,5]. Areas of stained soil (brown and green) and

puddles were noted at the foot of the lobes [5]. Leachate from the lobes may be flowing into Sutton Brook which traverses the site [5] (Attachment 1). An inactive loam operation is present near the owner's house in the northwest corner of the RLS. The town of Tewksbury has recently obtained an injunction to halt future loam operations due to wetlands violations. Heavy equipment and several piles of construction debris are found in this area [3].

The RLS site is bordered on the north by an old railroad grade, beyond that lie a piggery and wooded area. South and west of the site is a wetlands area which extends on-site and abuts the landfill lobes. An area used for ice skating is about 300 yards south of the Southern Lobe (Attachment 1). Residential areas are south and west of the site adjacent to the wetlands. Six private groundwater wells were found downgradient of the site, five are used for residential potable water supply, one is used for agricultural purposes. Groundwater flows under the site to the northwest [3,4].

Sampling of landfill soil, sediment, and leachate in October 1989 indicated the presence of substances from a number of chemical classes including polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), polynuclear aromatics (PNAs), pesticides, common solvents (e.g., xylenes), and metals [as cited in 5]. Results of the 1989 sampling indicated that with few exceptions the levels of the organic compounds were less than 10 parts per million (ppm) with most at levels in the parts per billion (ppb) range [5]. Soil lead levels were reported to be 371 ppm [5].

The most recent samplings and environmental evaluations conducted at the site occurred in December 1991 and in January 1992 and are the subject of this Consultation [5]. The primary purpose of the sampling was to determine if contaminated leachate from the landfill was introducing contaminants into the brook and into groundwater [5]. Sediment, leachate, and surface water samples were collected and analyzed for organic compounds (PNAs, VOCs, PCBs, and pesticides) and metals. The surface water samples reportedly contained sediment and were unfiltered [6]. A few sediment samples collected from Sampling Stations 10, 14, and 15 (See Attachment 1) were analyzed by X-ray fluorescence (XRF). Drinking water from private wells near the site was sampled and analyzed for organic compounds and metals [5]. All wells were downgradient of the landfill.

During the December 1991 site activities, odors were noted by the EPA Technical Assistance Team (TAT) that conducted the investigation. Fluctuating readings on the flame ionization

Page 3 - Louise House

detector (FID) indicated the possible presence of methane, near the northern landfill lobe. Elevated readings (40-60 units) on the FID were also recorded immediately above the surface of shallow waters running through a marshy area southwest of the southern landfill lobe. During the January sampling, no elevated FID or Photoionization detector (PID) readings above background were recorded [5]. Local residents have occasionally complained of odors [3].

Analytical results indicated that levels of organic contaminants and metals in sediment, soil, and stream water were, in general, below levels of detection [5]. Surface water samples obtained from Station 10 did show elevated levels of total arsenic and lead, 3.18 milligrams per liter (mg/l) and 0.084 mg/l, respectively. In comparison, other surface water samples contained lesser concentrations of arsenic (0.015 mg/l) and lead (0.050 mg/l) [5]. Results of XRF also indicated elevated levels of arsenic (660 ppm) in a "sediment" sample taken from Station 10 which was described as being 99% aqueous and containing about 0.5 grams of sediment [5]. Lead was detected by XRF (270 ppm) in a sediment sample from Sampling Station 14 [5].

No elevated levels of organic contamination were found in the samples of private drinking water [5]. Levels of metals in the water were at or near appropriate EPA standards and guidelines [5,7,8]. No information was provided about background levels of metals and other substances in area groundwater.

DISCUSSION

Results of prior sampling and the most recent sampling indicate that only low levels of organic substances and metals contamination are present in sediments and stream water. The most recent sampling of "surface water" (which apparently contained some sediment) and sediment did show elevated levels of arsenic and lead contamination at one of the sampling stations (Station 10) [5]. Although the levels for arsenic in water and sediment at this location would be a cause for some concern if the surface water was being used chronically for potable purposes or if such levels were present in sediment/soil in someone's backyard where frequent contact might occur [8], a direct contact threat via ingestion, inhalation, or dermal contact does not appear to be likely. Steep slopes and ditches and heavy vegetation consisting of sticker bushes and brambles makes frequent exposures unlikely. Furthermore, even in the unlikely event that some small child (one to two years old) would gain access to Station 10 and ingest relatively large amounts (one to five grams) of sediment/soil or consume a large quantity of water

Page 4 - Louise House

(as much as a liter) over a short period of time (hours to days), no acute toxic effects would be expected to occur [7,8].

Complaints of odors believed to be emanating from the landfill may indicate that methane and perhaps other gases and vapors are being released on a periodic basis. Positive readings occurred in December but were not present in January. However, the magnitude of the FID readings would indicate that if methane or other volatile substances were present, they were present in concentrations (approximately 60 ppm total organics if one assumes one unit on the FID equals 1 ppm) that would not pose either an acute health threat or a threat of fire and explosion. Some of the odor complaints may actually be due to the release of methane and other marsh gases from the wetlands and marshlands. Odors from wetlands and marshes are common as a result of decaying plant and animal life. Reports of protruding metal and debris could indicate that occasional lacerations or puncture wounds could occur during on-site recreational activities.

CONCLUSIONS

Based on the results of data from 1989 sampling and from the most recent data, ATSDR does not believe that levels of chemical substances detected at the site (at this time) pose an immediate health threat to nearby residents or those that gain access to the site for recreational purposes.

RECOMMENDATIONS

Although no contamination was detected, groundwater monitoring of nearby downgradient private wells should continue for the time being until complete site characterization is accomplished.

If any additional information becomes available or if any clarification is needed please do not hesitate to contact this office at (404) 639-0616.


Allan S. Susten, Ph.D., DABT

Attachment

Page 5 - Louise House

REFERENCES

1. Memo from Mary Ellen Stanton, Site Investigator, EPA, to Louise House, ATSDR, requesting ATSDR health consultation, March 10, 1992.
2. Memo from Lynelle Neuffer, Community Health Branch, to Allan Susten, transmitting Draft Scoping Report for Rocco's Landfill, March 13, 1992.
3. Draft Scoping Report, Rocco's Landfill, March 13, 1992.
4. Draft Trip Report, Site Scoping Visit for Rocco's Landfill, by Lynelle Neuffer, RN, ATSDR, February 22, 1992.
5. Removal Program Preliminary Assessment/Site Investigation for Rocco's Landfill with attached data, Tewksbury, MA, TDD No. 01-9112-10A, February 1992.
6. Personal communication from Ted Bzenas and Suzanne Simon, ATSDR Region 1, March 24, 1992.
7. ATSDR Draft Toxicological Profile for Lead (Update), October 1991.
8. ATSDR Draft Toxicological Profile for Arsenic (Update), October 1991.

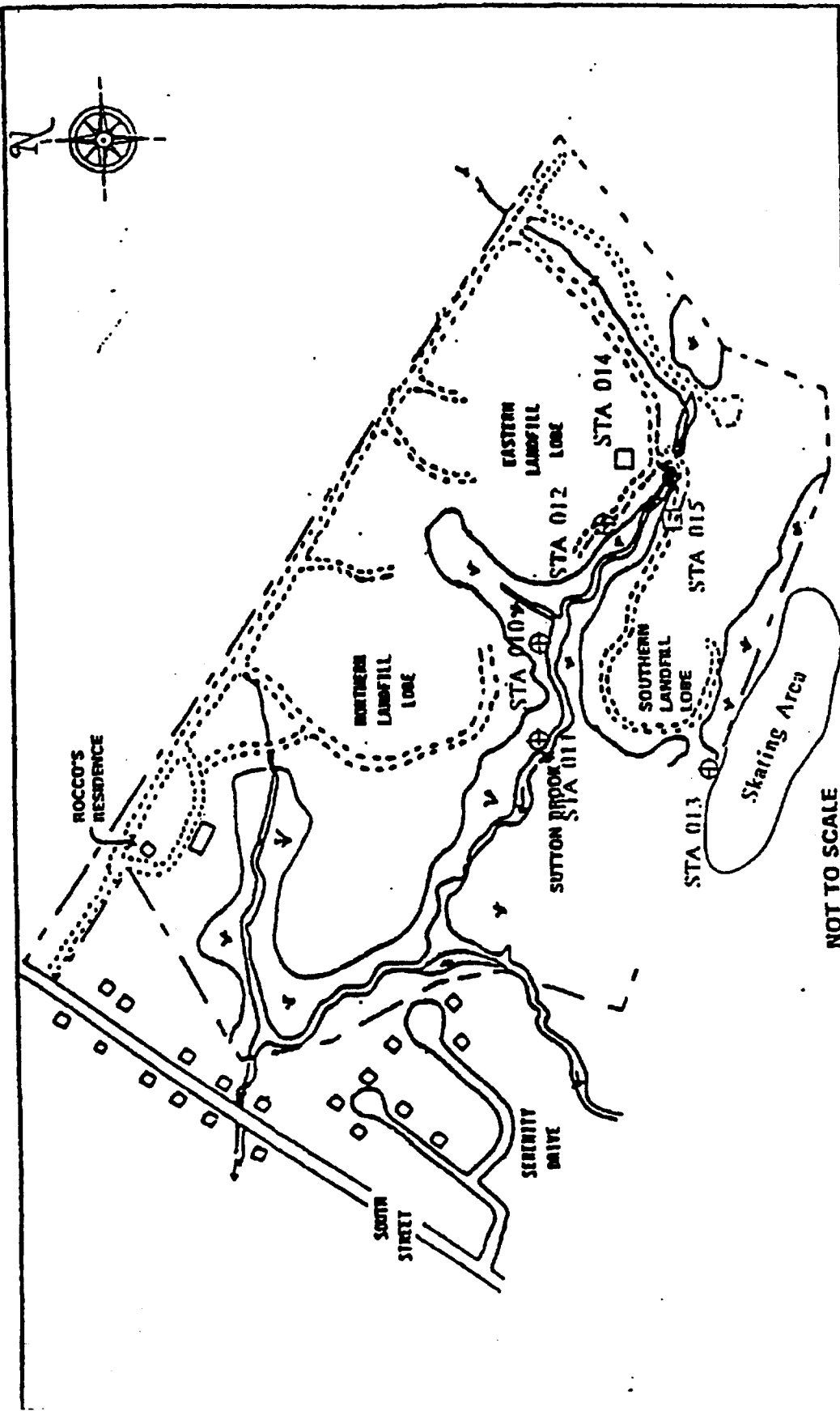


FIGURE 2

SITE DIAGRAM AND SAMPLING LOCATIONS

ROCCO'S LANDFILL, TEWKSBURY, MASSACHUSETTS

- SEDIMENT/LEACHATE SAMPLE
- ⊕ SURFACE WATER SAMPLE

SOURCE: U.S. EPA, 1991, WASTE MANAGEMENT DIVISION, FINAL SCREENING SITE INSPECTION, ROCCO'S DISPOSAL AREA, PREPARED BY NUS CORPORATION, FIELD INVESTIGATION TEAM.

- - - SITE BOUNDARY
- ~ STREAM
- ~ MARSH
- - - ACCESS ROAD
- HOUSE
- BUILDING

NOT TO SCALE

WESTON

REGION I TECHNICAL ASSISTANCE TEAM

DRAWN CKG	DATE 2/92	PAGE # 1678
APPROVED [Signature]	DATE 2/92	FIG # 01-9112-10A

January/February 1992



Commonwealth of Massachusetts

Executive Office of Environmental Affairs

**Department of
Environmental Protection**

Metro Boston/Northeast Regional Office

William F. Weld

Governor

Daniel S. Greenbaum

Commissioner

MEMORANDUM

TO: File

THROUGH: Steve Johnson, Acting Section Chief, Site Management Branch

FROM: Liz Callahan, Environmental Analyst
Paul Giddings, Environmental Analyst

DATE: March 22, 1992

RE: TEWKSBURY - Rocco's Landfill, DEP Case #3-3893

BACKGROUND

This memorandum provides a summary of field investigation activities conducted in the area surrounding the Rocco's landfill site during a period from January 27, 1992 to February 12, 1992. These activities were performed by Paul Giddings and Liz Callahan, both members of the Northeast Regional Office Site Management staff. The Site Management Branch investigation was initiated following a public meeting concerning the Rocco landfill, held on January 9, 1992. At that meeting, concerns were raised about the alleged disposal of hazardous materials at the landfill and the possible risks posed by the landfill to the health of residents living nearby.

There was some question as to whether the landfill could be the source of volatile organic compounds (trichloroethylene, toluene and xylenes) detected in tap water samples taken from three homes on Regina S. Drive, located northwest of the site. These homes all receive water from Tewksbury's municipal water supply. No contaminants, however, were detected in samples taken on the same day as the tap samples from two other locations along the water supply distribution system (South Street and Bemis Circle). Because the volatile organic compounds (VOCs) found in the Regina S. Drive homes were not detected throughout the distribution system, the Department set out to investigate whether a more localized condition, i.e., the infiltration of contaminated groundwater into the water pipes directly supplying these homes, might exist.

FIELD ACTIVITIES

Soil Gas Monitoring:

To investigate whether a localized condition of groundwater contamination by VOCs exists in the Regina S. Drive neighborhood, the Site Management Branch planned to conduct soil gas sampling and analysis. Soil gas monitoring is used in site assessment work as a screening tool for the identification of volatile organic contaminants in subsurface soils and groundwater. VOCs in groundwater will volatilize, to some extent, into air spaces in the overlying soil. Soil gas samples are obtained using a steel probe driven into the soil above the water table. A small pump is used to draw the soil gas through the probe to a sampling port above the ground surface. Samples are extracted from the sampling port using a syringe and analyzed on-site using a portable gas chromatograph.

Soil gas sampling efforts were initiated on January 27, 1992. Attempts were made at obtaining a sample from in front of 70 Regina S. Drive, near the location where the water inlet pipe enters the house. Problems, however, were experienced maintaining an air tight seal on the sampling syringes. Mr. Giddings and Ms. Callahan decided to try again the following day using new syringes.

On January 28, 1992, six soil gas samples were taken in the Regina S. drive neighborhood (see sampling plan, attached). Three samples were taken in front of 70 Regina S. Drive, and three samples were taken along South Street, near the access roads to Rocco's landfill and the Krochmal Farm. These samples were analyzed on-site using the portable gas chromatograph. The results of these analyses were measured against two VOC standards¹. No VOCs were detected in any of these samples.

Groundwater and Surface Water Sampling:

The soil gas sampling efforts were hampered by the clogging of the sampling probe. Silty soil continually clogged the intake ports, through which the samples are drawn from the soil into the probe. This problem lead Mr. Giddings and Ms. Callahan to question whether the samples they obtained were representative of the true soil gas conditions. They decided, therefore, to confirm the soil gas results by directly sampling the groundwater at the same locations. Given the shallow depths to groundwater in the area

¹ The first analytical standard contained benzene, toluene, ethyl benzene and xylenes; the second standard contained trichloroethylene and 1,1,1-trichloroethane. These standards were prepared specifically for this investigation on the basis of the tap water sampling results and the findings of the EPA Final Screening Site Inspection report on the Rocco site (August 15, 1991). These VOCs are relatively mobile in groundwater and were detected in samples taken at the landfill.

surrounding the landfill (less than five feet below ground surface) it is possible to drive the sampling probe below the water table and collect groundwater samples.

On January 29, 1992, two groundwater samples were taken in duplicate from a wetland area just south of the southernmost landfill lobe (see sampling plan) which was accessed via Carleton Street Extension. In addition to these samples, surface water samples were taken from Sutton Brook, south of the eastern landfill lobe (at the approximate location where the EPA sediment sample SD-01 was taken). These samples were analyzed in the DEP's Northeast Regional Office using the portable gas chromatograph. No VOCs were detected in the groundwater samples. Toluene and ethyl benzene were detected in the surface water sample at 450 and 75 parts per billion (volume per volume headspace sample), respectively. This result is consistent with the result of the EPA's sediment analysis at this location which found toluene, ethyl benzene and xylene at low part per billion (ug/kg) levels.

On February 7, 1992, groundwater sampling was conducted along South Street, in approximately the same locations as the soil gas monitoring (1/28/92). Samples were taken on each side of the access road to the landfill from an approximate depth of five feet below ground surface. The third sampling point was driven into the frozen streambed just east of the Krochmal access road to a depth of approximately nine feet below the surface of South Street. In addition to the samples collected along South Street, groundwater samples were taken from 70 Regina S. Drive and from a private irrigation well installed to a depth of about 15 feet below grade at 22 Morningside Drive.

The investigation was concluded on February 12, 1992. On this day, groundwater was sampled at 71 Regina S. Drive. Surface water samples were taken from a wetland behind 121 Regina S. Drive and from the man-made pond behind 70 Regina S. Drive.

All of the surface water and groundwater samples taken on February 7th and 12th were sent to the Lawrence Experiment Station, DEP's analytical chemistry laboratory, and analyzed using EPA Method 8240. No contaminants were detected in the groundwater samples taken along South Street, at 22 Morningside Drive and at 70 and 71 Regina S. Drive. No contaminants were found in the surface water sample taken from behind 70 Regina S. Drive. VOCs (toluene, ethyl benzene, xylenes, 1,1-dichloroethane, 1,1,1-trichloroethane and methyl isobutyl ketone) were detected at low part per billion concentrations (ug/l) in the surface water behind 121 Regina S. Drive (54 ug/l total VOCs).

CONCLUSIONS

Based upon the results of the limited field investigation conducted by the Site Management Branch, there is no indication of VOCs in the shallow groundwater in the area northwest of the landfill. These findings are consistent with the results of

analyses of water samples from private wells in the area. (No VOCs were detected in the water sample taken by EPA from the private well at the Rocco residence). The tap water from the three homes on Regina S. Drive where the VOCs were first detected has been resampled and analyzed twice since the January public meeting. No organic compounds (other than chloroform and bromodichloromethane which are typically present in chlorinated water) were detected in either round of samples.

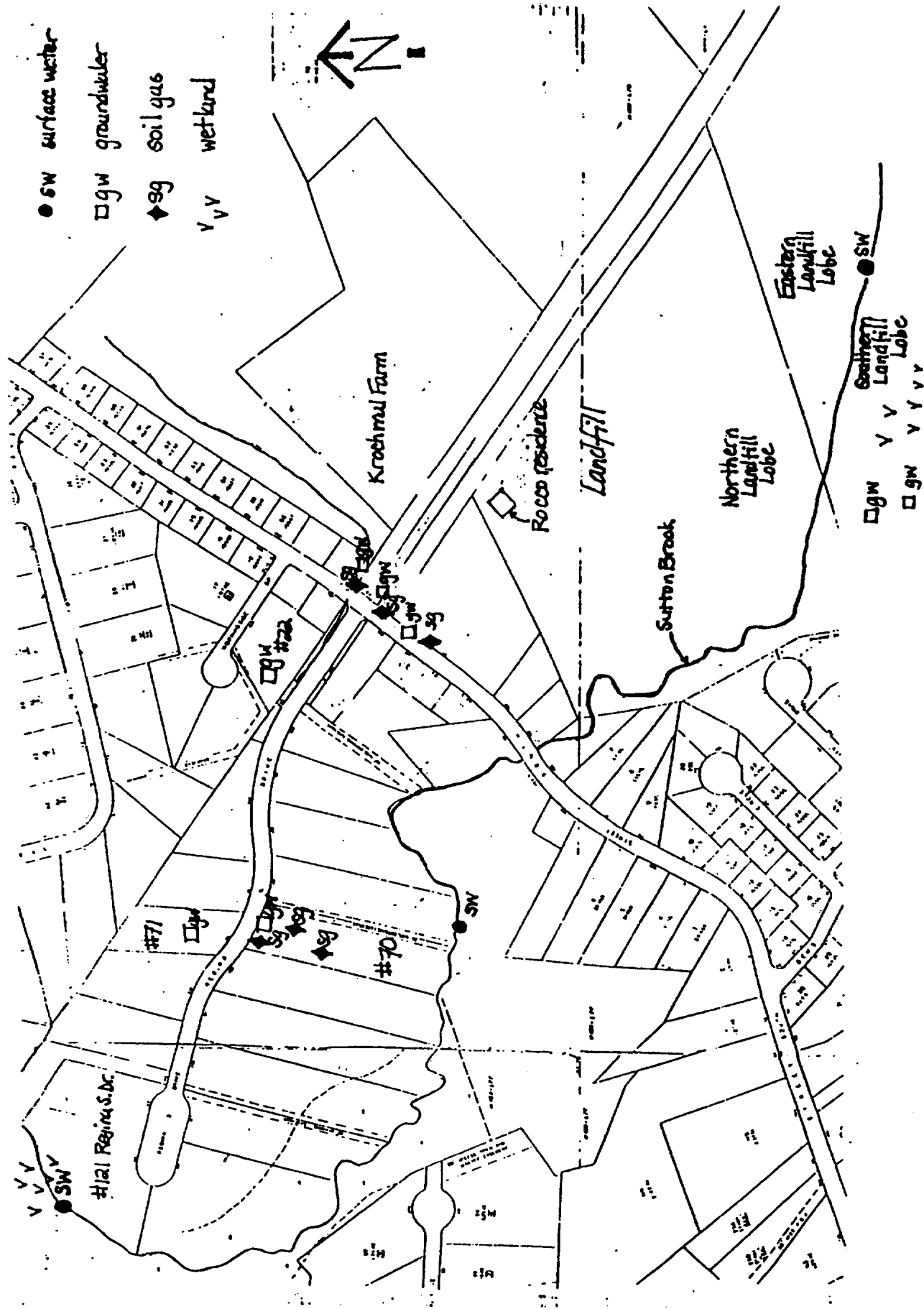
While no VOCs were detected in shallow groundwater, evidence of VOCs in the surface water of Sutton Brook, and in the wetlands behind 121 Regina Drive, was found. The landfill is the suspected source of the VOCs in Sutton Brook, although more sampling upstream and downstream of the site are necessary to rule out other possible sources. At this point, the source of the VOCs found in the wetlands behind 121 Regina S. Drive is unknown. A connection to the landfill or other possible sources is not possible without further field study.

The objective of this survey was confined to determining whether VOCs are present in the shallow groundwater in the Regina S. Drive neighborhood. Based upon the finding of no VOCs in the shallow groundwater, the Department concludes that there is no threat of contaminants either infiltrating the water supply lines or volatilizing into the indoor air of the residences in the Regina S. Drive neighborhood.

The conclusions of this study are based on a limited field survey. This study does not substitute for a comprehensive hydrogeologic assessment of the landfill and the surrounding area. Further investigation would be necessary to evaluate the nature and extent of hazardous materials in the soil, groundwater, and air at the landfill site and in the surface water and sediment of Sutton Brook.

LEWISBURY- Rocco's Landfill, South Street

Sampling Plan (1/27/92 - 2/12/92)



March 10, 1992

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

LAWRENCE EXPERIMENT STATION
37 SHATTUCK STREET
LAWRENCE, MASS. 01843

OIL IDENTIFICATION

PROCEDURE

The procedure used for the identification of refined petroleum products is derived from the method "Gas Chromatography of High Molecular Weight Hydrocarbons with an Inorganic Salt Eutectic Column". (Anal. Chem., Vol. 50, No. 2, February 1978, 379)

A 2% solution in pentane of the oil sample is analyzed in a Perkin Elmer Gas Chromatograph equipped with a flame ionization detector and an SPB - 1 capillary column. The chromatogram obtained is compared with chromatograms of a 2% solution in pentane of reference oils. The references are the refinery fractions gasoline, kerosene, diesel oils, heating oils and wide-cut gas oil (lube oils).

Two chromatograms are run for both the sample and the reference oil. In the second run they are spiked with a standard solution of known saturated hydrocarbons ranging from nine to twenty-four carbon atoms. The petroleum hydrocarbons in the sample are tentatively identified by the overlapping of peaks with similar retention times and the corresponding oil is identified by comparison with the reference oil.

SPECIAL ANALYSIS

collector: T. Carbone & Karen Golden

SOURCE C

Date 3/20/92

Conc. Units mg/Kg

[illegible]

REMARKS:

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING
LAWRENCE EXPERIMENT STATION

SPECIAL ANALYSIS

CITY/TOWN TEWKSBURY

COLLECTOR Karen Golden

SOURCE A Rocco Landfill, Loom Business, #1

SOURCE B Duplicate

SOURCE C Blank

SOURCE D

SOURCE E

SOURCE F

Michael D. Bebrun
3/18/92

	A	B	C	D	E	F
SAMPLE NUMBER	92-311	Duplicate 92-311	Blank			
DATE OF COLLECTION	3/10/92	3/10/92	-			
DATE OF RECEIPT	3/11/92	3/11/92	-			
DATE ANALYZED	3/12- 3/18/92	3/12- 3/18/92	3/12- 3/18/92			
Total petroleum hydrocarbons (ug/g)	1100	1400	< 70			

REMARKS: The samples were analyzed according to Methods 503D and E, "Extraction Method for Sludge Samples". Standard Methods, 16th Edition, 1985. p.501

The presence of petroleum hydrocarbons was confirmed by Gas Chromatography/FID.



Board of Health
Town Hall
Tewksbury, Massachusetts 01876
851-6371

April 2, 1992

Attorney Charles J. Zaroulis
9 Middlesex Street
Lowell, MA 01852

re: Rocco's Landfill

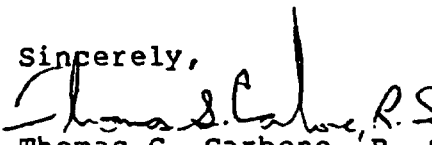
Dear Mr. Zaroulis:

Enclosed are the results of testing of soil samples collected on March 10, 1992 at Rocco's Landfill. The samples were collected that afternoon, and locked in the file cabinet inside my office overnight, with the keys to both in my possession. Karen Golden, of DEP, collected the sample from me and delivered it to the Lawrence Experimental Station the following day, following chain of custody.

The results showed "the presence of a weathered No. 6 fuel oil." You will recall that this soil was collected from a pile of soil behind the loam screening area, where I noted piping and concrete indicative of a service station.

Mrs. Carol Rocco has requested a copy of the results; please advise me if I may release this information.

Sincerely,


Thomas G. Carbone, R. S.
Director of Public Health
TGC/vc

cc: Board of Health
Mr. Cressman
Fire Department



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering

Lawrence Experiment Station

37 Phalluck Street, Lawrence, Massachusetts 01843

PAGE 2 OF 2

SAMPLE(S) ANALYSIS
RESULTS

RECEIVED

MAR 30 1992

BOARD OF HEALTH
TEWKSBURY, MA

Michael D. Beltrian
3/19/92

COLLECTOR Karen Golden
RECEIVED 3/11/92

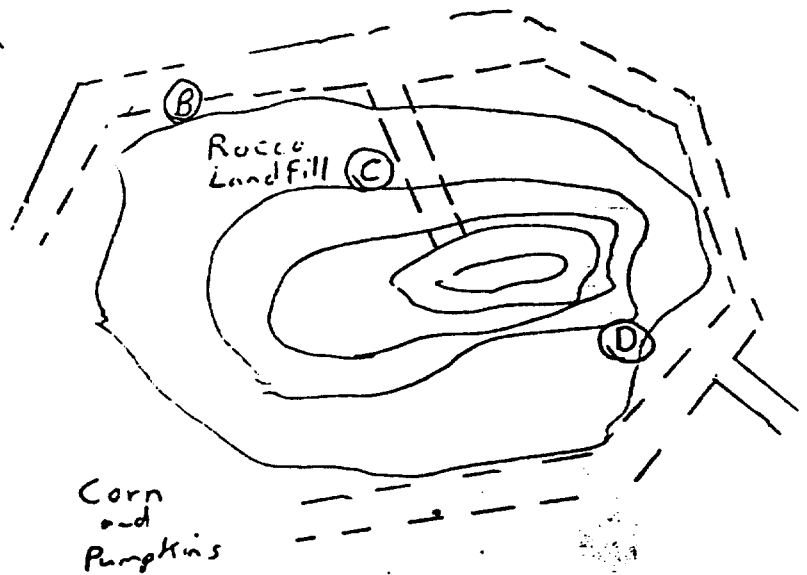
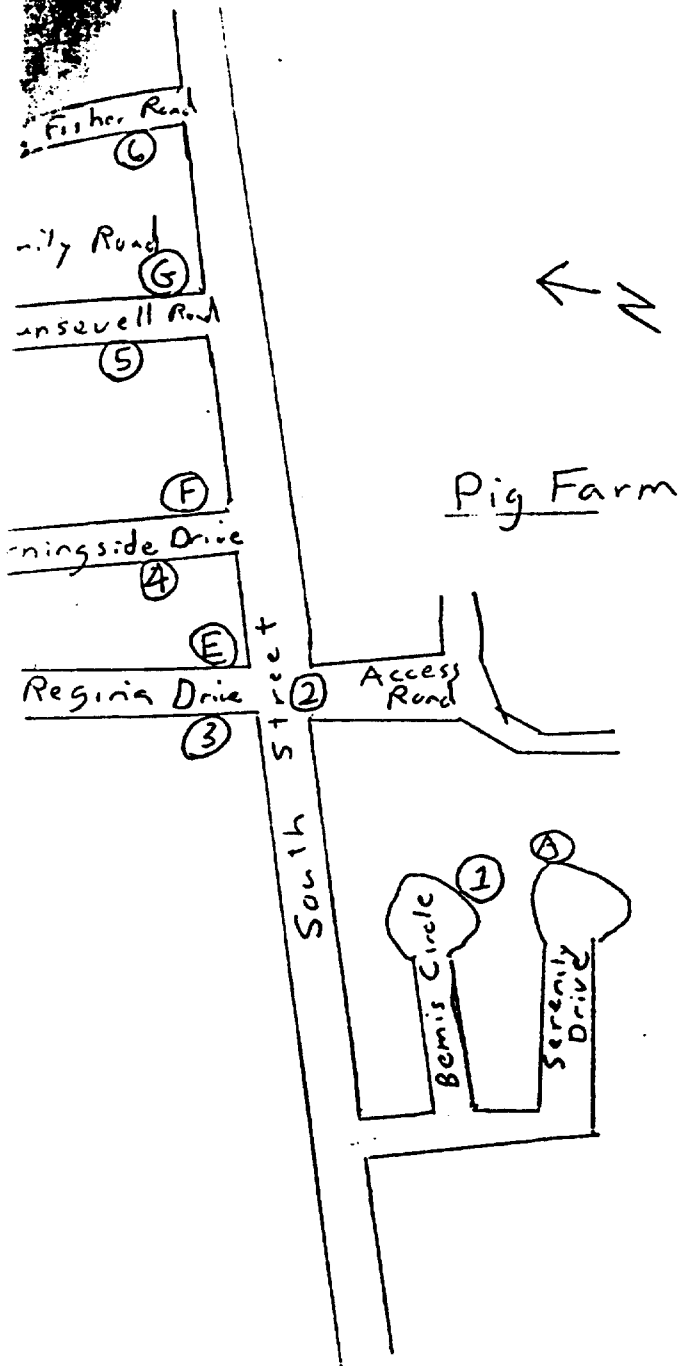
CITY/TOWN TEWKSBURY
COLLECTION DATE 3/10/92
ANALYZED 3/12-18/92

1. SAMPLE NO. 92-311
SOURCE Rocco Landfill, Loom Business, #1

RESULT The sample was extracted with pentane prior to gas chromatographic analysis. The sample chromatogram revealed the presence of a weathered No. 6 fuel oil.

July 29, 1992

Rocco Landfill and Vicinity
Air Monitoring Locations
(not to scale)



August 20, 1983



Commonwealth of Massachusetts
Executive Office of Environmental Affairs

**Department of
Environmental Protection**

Daniel S. Greenbaum
Commissioner
Oscar C. Pancorbo
Director

Lawrence Experiment Station, Division of Environmental Analysis

October 9, 1992

RECEIVED

OCT 14 1992

**BOARD OF HEALTH
TEWKSBURY, MA**

Board of Health
Town of Tewksbury
Town Hall
Tewksbury, MA 01876
Attention: Thomas Carbone

Dear Mr Carbone,

Attached is the report for the ambient air monitoring program which has been conducted in the vicinity and on the grounds of the Rocco Landfill on South Street in Tewksbury this year. In this report, you will find that the DEP Air Quality Surveillance Branch has conducted a representative number of short air monitoring surveys which did not detect elevated levels of toxic air pollutants in the area.

If you have any questions or comments regarding this report or the program, please feel free to contact me in Lawrence at (508) 975-1138.

Sincerely,

Thomas McGrath
Supervisor, Special Studies
Air Quality Surveillance Branch

cc: William Gaughan, NERO
Stephen Johnson, NERO
Donald Steele, AQSB
Robert Donaldson, DAQC

Ambient Air Monitoring: Rocco Landfill - Tewksbury

The Air Quality Surveillance Branch of the Department of Environmental Protection conducted an ambient air quality study in the vicinity of the Rocco Landfill in Tewksbury. The study was comprised of a series of one day surveys which occurred between April and September, 1992. No significant odors or upscale measurements were observed offsite during any of the fourteen (14) site visits, nor were elevated levels (above background) of any toxic volatile organic compounds (VOCs) detected in any of the time weighted ambient air samples taken on two occasions on and around the landfill.

After a number of odor complaints were received and health concerns were expressed by residents living in the vicinity of the closed Rocco Landfill, the Northeast Region of the DEP requested in January 1992 that the Air Quality Surveillance Branch conduct an ambient air monitoring survey in the area. The AQSB requested and received a copy of the record of previous complaints (with times, dates and odor descriptions) from the Tewksbury Board of Health. Based on this information and the level of resources available for this study, the AQSB developed a strategy of short surveys using continuous screening instrumentation supplemented with several time weighted sampling events (for Toxic VOCs).

Procedures

A schedule of odor/continuous air quality measurement site visit surveys was developed which focussed primarily on the warmer months. Alternate morning and evening site visit/surveys were conducted. A total of fourteen (14) surveys between February and September, 1992 were performed.

Measurements using real time continuous instruments, including an Arizona Instruments Hydrogen Sulfide Analyzer and an HNU Systems 101 portable photoionization detector (for measuring total ionizable volatile organic compounds), were taken at a number of locations in the vicinity of the landfill. These locations (see attached map) included Bemis Circle and Serenity Drive, south of the landfill, South Street (at the landfill entrance gate) and Morningside Drive, Regina Drive, Rounsevell Road and Kingfisher Road west of the landfill. Stainless steel whole air SUMMA canisters were taken on the surveys for sampling if upscale readings were observed. However, it was not necessary to take these samples during any of the surveys.

Two hour, time weighted and instantaneous grab canister samples were taken on two occasions (July 29 and August 21) during the monitoring program at a number of locations on and around the landfill. Constant flow was maintained to the time weighted canister samples for the two hour intervals using SIS mechanical flow controllers. Grab samples were taken by opening the valve on the top of the canister and letting the pressure equalize to atmospheric (from -29 inches of vacuum).

Two time weighted sampling events (resulting in eight (8) total samples) were conducted on July 29. In the morning, two hour samples were taken at Serenity Drive (generally upwind), at Regina Drive (generally downwind) and on the landfill (immediately east of the landfill mound). Duplicate, side by side samples were taken at the landfill location. A walkover survey of the landfill using an HNU Systems Portable Photoionization Detector Analyzer (PID) was conducted in the morning. In the afternoon, two hour samples were taken at two offsite downwind locations (Morningside Drive and Rounsevell Road) and at two onsite locations where odors were observed during the morning survey (see map). Light winds were observed from the southwest (averaging 7.5 MPH and 254 degrees according to DEP Lawrence air monitoring station) on this day and the temperature ranged from 80 to 85 degrees Fahrenheit.

A second set of time weighted samples were taken on August 21. This survey coincided with a site survey using continuous instrumentation and whole air SUMMA canister samplers which was conducted by Region I U. S. Environmental Protection Agency personnel. The EPA study concentrated on potential specific sources (such as gas "outbreaks" (ie. erosion)) of gas emissions on the landfill. On this date, two hour time weighted samples were taken at Serenity Drive, on the landfill and at Rounsevell Road. Instantaneous grab canister samples were taken side by side at all three locations and an EPA sample was taken side by side with DEP samples at the landfill location. The wind was blowing from the northwest (averaging 7 MPH and 334 degrees according to the Lawrence station) with temperatures in the seventies with high (70%) humidity.

DEP canister samples were analyzed for volatile organic compounds (VOCs) using a Chrompack Gas Chromatograph with flame ionization and electron capture detectors. Blank and calibration samples (for Aromatic (benzene, toluene, ethyl benzene and xylene) and Chlorinated (methylene chloride, 1,1,1 trichloroethane, trichloroethylene and tetrachloroethylene) were analyzed with each sample set. Because of an applications problem, only non-chlorinated hydrocarbons (including benzene, toluene and xylene) could be successfully quantified by this analysis. EPA samples were analyzed using a gas chromatograph - mass spectrometer, which is capable of yielding more conclusive VOC identification.

Results

Table 1 presents the results of the short surveys conducted throughout 1992 in the vicinity of the Rocco Landfill by DEP Air Quality Surveillance Branch staff: Table 2 (A and B) presents the results from the analysis of time weighted and grab SUMMA canister samples taken by DEP at and around the Rocco Landfill on July 29 and August 21. The results from the USEPA survey will be available in their report. However, preliminary results from the analysis of their ambient air samples taken on the landfill indicate levels of health relevant VOCs at or below typical ambient background concentrations.

Although offsite ambient locations used for taking time weighted and grab samples did not represent perfect upwind/downwind alignment, no elevated concentrations (as compared to background ambient levels measured at other ambient locations in Massachusetts) of health relevant volatile organic compounds were found at any site, including those on the landfill where odors were observable. Preliminary results from the USEPA study appear to confirm these findings. An offsite odor was only observed during one site visit. That was identified as an animal odor and was observed near the front gate of the Landfill and Pig Farm. No upscale continuous monitor measurements were recorded on that occasion.

TABLE 1 - Continuous Surveys Measurements/Observations

<u>Time/Date</u>	<u>Measurements/Observations</u>	<u>Comments/Conditions</u>
2/92	No Measurements. No Odors.	Preliminary Survey.
4/11/92 (5:15 pm)	No Odors Observed.	about 55 F
4/22/92 (10:15 am)	No Odors Observed.	about 65 F; Cloudy S-SW Wind
5/6/92 (10:15 am)	No Odors Observed.	45-50 F 0-10 mph; SE Winds
5/13/92 (7:00 pm)	Slight Pig Odor at Entrance No Elevated PID Readings	East Wind; 70 F; Fair
5/21/92 (9:15 am)	No Odors Observed	60-65 F; N-NW Wind 0-5 MPH
6/9/92 (6:15 pm)	No Odors Observed	80 F; Relatively Dry
6/19/92 (9:05 am)	No Odors Observed	65-70 F; Light Shifting Winds
7/2/92 (6:12 pm)	No Odors Observed	80 F; Fair Low Wind; Dry
7/13/92 (9:20 am)	No Odors Observed	70 F; Humid Gusty Wind; W-SW
7/29/92 (10:00 am)	No Odors Observed Offsite Onsite Survey with PID Odors Observed on gravel road to landfill top and near path on Southwest side of landfill. No upscale PID readings onsite.	80-85 F; SW Wind
8/11/92 (5:54 pm)	No Odors Observed	85 F; Cloudy; Humid No Wind
8/21/92 (9:30 am)	No Odors Observed Offsite. Odors onsite at same locations as 7/29	72 F; Humid; Fair NW Wind at 12 MPH
9/10/92 (10:05 am)	No Odors Observed	SW Wind; 0-10 MPH

Table 2A - Results of Two Hour, Time Weighted Samples
July 29, 1992

<u>Location/Time</u>	<u>Concentrations (parts per billion)</u>	
	<u>Benzene</u>	<u>Toluene</u>
Serenity Drive 10:53 am - 12:53 pm	BDL	1.0
Landfill Mound 10:00 am - 12:00 noon	BDL	0.4
Landfill Mound (Duplicate) 10:04 am - 12:04 pm	BDL	0.5
Regina Drive 10:17 am - 12:20 pm	BDL	0.4
On Landfill Mound Access Road 1:08 pm - 3:08 pm	BDL	0.4
East Side of Mound Near Breakout 1:15 pm - 3:15 pm	BDL	BDL
Morningside Drive 12:30 pm - 2:30 pm	BDL	0.5
Donsevell Road 12:35 pm - 2:35 pm	0.1	1.2

Notes: BDL = Below Detection Limits; Neither Ethyl Benzene nor Xylene were detected in these samples. Benzene and toluene are normally found at concentrations of about 1 ppb and 2-4 ppb respectively at typical ambient locations.

Winds from the Southwest (254 degrees at 7.5 MPH)

Table 2B - Results of Two Hour, Time Weighted and
Instantaneous Grab Samples
August 21, 1992

Concentrations (parts per billion)

<u>Site/Time</u>	<u>Benzene .</u>	<u>Toluene</u>
Serenity Drive 9:45 am - 11:45 am	0.2	0.5
Serenity Drive (Grab) 9:40 am	0.1	BDL
Landfill Mound Access Road 10:32am - 12:32 pm	0.3	1.3
Landfill Mound Access Road (Grab) 10:42 am	0.1	BDL
Rounsevell Road 11:00 am - 1:00 pm	0.2	1.1
Rounsevell Road (Grab) 9:54 am	0.1	0.5

Notes: BDL = Below Detection Limits; Neither Ethyl Benzene nor Xylene were detected in these samples. Benzene and toluene are normally found at concentrations of about 1 ppb and 2-4 ppb respectively at typical ambient locations.

Winds from the Northwest (334 degrees at 7 MPH)

Monitoring Locations - See Attached Map

Continuous Survey Monitoring Locations

1. Basis Circle/Serenity Drive
2. South Street /Front Gate of Landfill
3. Regina Drive
4. Morningside Drive
5. Rounsevell Road
6. Kingfisher Road

Time Weighted (and Grab) Sampling Locations

- A. Serenity Drive
- B. North of Landfill Mound
- C. Landfill Mound Access Road
- D. East of Landfill Mound
- E. Regina Drive
- F. Morningside Drive
- G. Rounsevell Road

1
RECEIVED

OCT 20 1993

BOARD OF HEALTH
TEWKSBURY, MA

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL
DIVISION OF ENVIRONMENTAL ANALYSIS
LAWRENCE EXPERIMENT SECTION

now was brought in
by Judy Fittery.
DEP ASKED HER TO
give you a copy
ASAP.

10-20-93 11:00

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS
OF PURGEABLE ORGANICS

Sample Number 93-1958

City/Town Tewksbury

Collector Giddings

Collected 8/20/93

Received 8/20/93

Analyzed 9/9-23/93

Extracted 8/23/93

Source Roccas/Fittery Rsd. #1

RESULTS		MDL*	QUALITY CONTROL	
Compounds	ug/g	ug/g	Surrogate Standards	%Recovery
Toluene	0.61	0.14	1,2-dichloroethane-D4	87
			Toluene-D8	90
			1,4-bromofluorobenzene	105
Dry weight @ 105°C	94%			
*MDL = Minimum Detection Limits				

The sample was analyzed according to the EPA procedure, "Method 8240-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 1B. Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

Laboratory Supervisor

Debra R. J. Liherty
9/30/93

Left end of pool - shallow end -
under main line

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL ANALYSIS
LAWRENCE EXPERIMENT STATION

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS
OF PURGEABLE ORGANICS

Sample Number 93-1959

Collector Giddings

Received 8/20/93

City/Town Tewksbury

Collected 8/20/93

Analyzed 9/9-23/93

Extracted 8/23/93

Source Roccos/Fitterv Rsd. #2

RESULTS		MDL*	QUALITY CONTROL	
Compounds	ug/g	ug/g	Surrogate Standards	%Recovery
Toluene	0.81	0.14	1,2-dichloroethane-D4	92
			Toluene-D8	98
			1,4-bromofluorobenzene	107
Dry weight @ 105°C	95%			
*MDL = Minimum Detection Limits				

The sample was analyzed according to the EPA procedure, "Method 8240-Gas Chromatography Mass Spectrometry for Volatile Organics, SW-846 1B. Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

**No standard available for quantification. The mass spectrum was compared to a mass spectral index and a mass spectral data base for tentative identification.

RECEIVED

OCT 20 1993

BOARD OF HEALTH
TEWKSBURY, MA

Laboratory Supervisor

Alba R. Gilester
9/30/93

Between Collins Brook + End of Pool Fence

Appendix D
Historical Analytical Results

- 1976 through 1979
 - August 1982
 - June 24, 1983
 - March 10, 1988
 - October 26, 1989
 - December 1991
- January/February 1992
 - March 10, 1992
 - July 29, 1992
 - August 20, 1983

1976 through 1979

The Commonwealth of Massachusetts
Department of Environmental Quality Engineering

Water Supply Analysis (mg. per liter)

Tewksbury

Collector:

Source A Monitoring Well - M-1-76

Source B

Source C

Source D

Source E

Source F

	A	B	C	D	E	F
Sample No.	539045					
Date of Collection	8/4/76					
Date of Receipt	8/5/76					
TURBIDITY	2					
SUSPENDED SOLID	1					
COLOR	80					
PH	3.4					
ALKALINITY-Total (CaCO ₃)	6.4					
RFYI	24					
OFF Scale	3.8					
HARDNESS (CaCO ₃)	38.					
CALCIUM (Ca)	11.					
MAGNESIUM (Mg)	2.5					
SODIUM (Na)	32.					
POTASSIUM (K)	3.1					
IRON (Fe)	.63					
MANGANESE (Mn)	.15					
SILICA (SiO ₂)	6.9					
SULFATE (SO ₄)	25					
CHLORIDE (Cl)	41.					
PEC. COND. (micromhos/cm)	120					
NITROGEN (AMMONIA)	.00					
NITROGEN (NITRATE)	.01					
NITROGEN (NITRITE)	.004					
COPPER (Cu)	.03					

Special

DB

NOV 24 1976

The Commonwealth of Massachusetts
Department of Environmental Quality Engineering

Water Supply Analysis (mg. per liter)

Tewksbury

Collector: T.W.D.

Source A Monitoring Well M - 1-76

Source B

Source C

Source D

Source E

Source F

Near Rocco's Landfill

Copy sent 29 Nov. 1976

Davis & Moore

	A	B	C	D	E	F
Sample No.	340334					
Date of Collection	11/17/76					
Date of Receipt	11/18/76					
TURBIDITY	2					
SEDIMENT	0					
COLOR	0					
ODOR	0					
pH	6.3					
ALKALINITY-Total (CaCO ₃)	6					
HARDNESS (CaCO ₃)	10.					
CALCIUM (Ca)	2.3					
MAGNESIUM (Mg)	0.9					
SODIUM (Na)	7.0					
POTASSIUM (K)	1.2					
IRON (Fe)	.07					
MANGANESE (Mn)	.10					
SILICA (SiO ₂)	11.					
SULFATE (SO ₄)	10					
CHLORIDE (Cl)	11.					
SPEC. COND. (micromhos/cm)	62					
NITROGEN (AMMONIA)	.00					
NITROGEN (NITRATE)	0.0					
NITROGEN (NITRITE)	.000					
COPPER (Cu)	.01					



727-6373
727-6792

The Commonwealth of Massachusetts

Division of Water Pollution Control

Eastern Regional Office

600 Washington Street - Room 350

Boston, Massachusetts 02111 **EAST REGION**

W54 H file

October 15, 1979

Department of Environmental Quality Engineering
Tewksbury State Hospital
Tewksbury, Massachusetts

Re: Sutton Brook -
South Street

Attention: Gerald McCall

Dear Sir:

This letter is in regard to a complaint regarding the landfill off South Street, Tewksbury.

On the request by Mr. William R. McMeninen Tewksbury Board of Health, an engineer from this office inspected the Sutton Brook near 1015 South Street, Tewksbury. The first visit, 5/8/79, he found minor pollution (sample results attached). During second site visit on 7/10/79 high turbidity in the Sutton Brook could be observed. Samples were again taken (results attached) which indicates pollutants in the brook.

Due to the legal action taken by DEQE against the private landfill off South Street our office will initiate separate action but may join your action with your approval if you desire.

Very truly yours,

Sabin M. Lord, Jr.
Sabin M. Lord, Jr.
Eastern Regional Engineer

SML/WC/adb

cc: William R. McMeninen, Tewksbury Board of Health, Town Hall, Tewksbury, Massachusetts

LAWRENCE EXPERIMENT STATION
WASTE WATER ANALYSIS (mg. per liter)
Collector:

TEWKSBURY

Cashina

SOURCE A Sutton Brook at South Street
SOURCE B
SOURCE C
SOURCE D
SOURCE E
SOURCE F

RECEIVED
EASTERN REGIONAL OFFICE

APR 10 1979

	A	B	C	D	E	F
SAMPLE NO.	R76193					
DATE OF COLLECTION	5/3/79					
TIME OF COLLECTION	11:30					
DATE RECEIVED	5/8/79					
COD	57					
BOD	2.1					
pH	6.5					
ALKALINITY, TOTAL	13					
SUSPENDED SOLIDS						
TOTAL SOLIDS						
TOTAL KJELDAHL - N						
AMMONIA - N	0.00					
NITRATE - N						
TOTAL P						
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE						
IRON	6.0					
COLOR	300					
SULFATE	23					

LAWRENCE EXPERIMENT STATION
WASTE WATER ANALYSIS (mg. per liter)
Collector:

TEWKSBURY

Cashins

NORTHEAST REGION

SOURCE A Tewksbury Brook 1015 South Street
SOURCE B
SOURCE C
SOURCE D
SOURCE E
SOURCE F

AUG 18 1979

RECEIVED
EASTERN REGIONAL OFFICE

	A	B	C		
SAMPLE NO.	R77024			AUG 30 1979	
DATE OF COLLECTION	7/10/79			RECEIVED DIVISION OF	
TIME OF COLLECTION	12:30 PM			EASTERN REGIONAL OFFICE	
DATE RECEIVED	7/10/79			AUG 3 1979	
				MASS. DIVISION OF	
COD	192			WATER POLLUTION CONTROL	
BOD	51				
pH	7.4				
ALKALINITY, TOTAL	240				
SUSPENDED SOLIDS	26				
TOTAL SOLIDS	618				
TOTAL VOLATILE SOLIDS	108				
IRON	12				
CHROMIUM	0.04				
TOTAL KJELDAHL - N					
AMMONIA - N	23				
NITRATE - N	0.4				
TOTAL P					
TOTAL COLIFORM					
FECAL COLIFORM					
CHLORIDE					
MANGANESE	1.8				
SULFATE	7				

NE

DIVISION OF ENVIRONMENTAL QUALITY ENGINEERING

LAWRENCE EXPERIMENT STATION

WASTE WATER ANALYSIS (mg. per liter)

Collector:

TEWKSBURY

Nickerson

NORTHEAST REGION

Tewksbury, Sutton Brook - South Street, Leachate

SOURCE A
SOURCE B
SOURCE C
SOURCE D
SOURCE E
SOURCE F

JUL 3 1979
DEPT. OF ENVIRONMENTAL
QUALITY ENGINEERING

	A	B	C	D	E	F
SAMPLE NO.	R78834					
DATE OF COLLECTION	6/26/79					
TIME OF COLLECTION	GPAB					
DATE RECEIVED	6/26/79					
COD	135					
BOD						
pH	7.1					
ALKALINITY, TOTAL	155					
SUSPENDED SOLIDS						
TOTAL SOLIDS	380					
TVS	106					
CONDUCTIVITY	500					
TOTAL KJELDAHL - N						
AMMONIA - N	10					
NITRATE - N	0.1					
TOTAL P						
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE						
IRON	12					
MANGANESE	1.4					

August 1982

The Commonwealth of Massachusetts
Department of Environmental Quality Engineering

Water Supply Analysis (mg. per liter)

Teuksbury

Collector: _____

Source A Monitoring Well - M-1-76

Source B

Source C

Source D

Source E

Source F

	A	B	C	D	E	F
Sample No.	539045					
Date of Collection	8/4/76					
Date of Receipt	8/5/76					
TURBIDITY	2					
SEDIMENT	1					
COLOR	80					
PH	3.4					
ALKALINITY-Total(CaCO ₃)	6.4					
RFM	Off Scale					
HARDNESS(CaCO ₃)	24					
CALCIUM(Ca)	38.					
MAGNESIUM(Mg)	11.					
SODIUM(Na)	2.5					
POTASSIUM(K)	32.					
IRON(Fe)	3.1					
MANGANESE(Mn)	6.9					
SILICA(SiO ₂)	25					
SULFATE(SO ₄)	41.					
CHLORIDE(Cl)	120					
PEC.COND.(micromhos/cm)	.00					
NITROGEN(AMMONIA)	.01					
NITROGEN(NITRATE)	.004					
NITROGEN(NITRITE)	.03					
COPPER(Cu)						

Special

The Commonwealth of Massachusetts
Department of Environmental Quality Engineering

Water Supply Analysis (mg. per liter)

DB

NOV 24 1976

Tewksbury

Collector: T.W.D.

Source A Monitoring Well M - 1-76

Source B

Source C

Source D

Source E

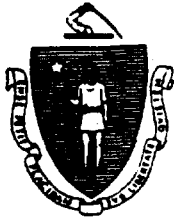
Source F

Near Rocco's Landfill

Copy sent 29 Nov. 1976

Dawes & Moore

	A	B	C	D	E	F
Sample No.	540354					
Date of Collection	11/17/76					
Date of Receipt	11/18/76					
TURBIDITY	2					
SEDIMENT	0					
COLOR	0					
ODOR	0					
pH	6.3					
ALKALINITY-Total(CaCO ₃)	6					
HARDNESS(CaCO ₃)	10.					
CALCIUM(Ca)	2.5					
MAGNESIUM(Mg)	0.9					
SODIUM(Na)	7.0					
POTASSIUM(K)	1.2					
IRON(Fe)	.07					
MANGANESE(Mn)	.10					
SILICA(SiO ₂)	11.					
SULFATE(SO ₄)	10					
CHLORIDE(Cl)	11.					
SPEC. COND. (micromhos/cm)	62					
NITROGEN(AMMONIA)	.00					
NITROGEN(NITRATE)	0.0					
NITROGEN(NITRITE)	.000					
COPPER(Cu)	.01					



727-6373
727-6792

The Commonwealth of Massachusetts

Division of Water Pollution Control

Eastern Regional Office

600 Washington Street - Room 350

Boston, Massachusetts 02111 NORTHEAST REGION

W51 H
file

October 15, 1979

Department of Environmental Quality Engineering
Tewksbury State Hospital
Tewksbury, Massachusetts

Re: Sutton Brook -
South Street

Attention: Gerald McCall

Dear Sir:

This letter is in regard to a complaint regarding the landfill off South Street, Tewksbury.

On the request by Mr. William R. McMeninen Tewksbury Board of Health, an engineer from this office inspected the Sutton Brook near 1015 South Street, Tewksbury. The first visit, 5/8/79, he found minor pollution (sample results attached). During second site visit on 7/10/79 high turbidity in the Sutton Brook could be observed. Samples were again taken (results attached) which indicates pollutants in the brook.

Due to the legal action taken by DEQE against the private landfill off South Street our office will initiate separate action but may join your action with your approval if you desire.

Very truly yours,

Sabin M. Lord, Jr.
Eastern Regional Engineer

SML/WC/adb

cc: William R. McMeninen, Tewksbury Board of Health, Town Hall, Tewksbury, Massachusetts.

Cashina

ALL: 1070

	A	B	C	D	E	F
SAMPLE NO.	R76193			<div> <div>RECEIVED</div> <div>EASTERN REGIONAL OFFICE OF WATER POLLUTION CONTROL</div> <div>JUL 15 1979</div> <div>MASS. DEPT. OF WATER POLLUTION CONTROL</div> </div>		
DATE OF COLLECTION	5/3/79					
TIME OF COLLECTION	11:30					
DATE RECEIVED	5/8/79					
COD	57					
BOD	2.1					
pH	6.5					
ALKALINITY, TOTAL	13					
SUSPENDED SOLIDS						
TOTAL SOLIDS						
TOTAL KJELDAIL - N						
AMMONIA - N	0.00					
NITRATE - N						
TOTAL P						
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE						
IRON	6.0					
COLOR	300					
SULFATE	23					

LAWRENCE EXPERIMENT STATION
WASTE WATER ANALYSIS (mg. per liter)
Collector:

TEWKSBURY

Cashins

NORTHEAST REGION

SOURCE A Tewksbury Brook 1015 South Street
SOURCE B
SOURCE C
SOURCE D
SOURCE E
SOURCE F

AUG 18 1979

RECEIVED
EASTERN REGIONAL OFFICE

	A	B	C	F
SAMPLE NO.	R77024			AUG 30 1979
DATE OF COLLECTION	7/10/79			RECEIVED DIVISION OF
TIME OF COLLECTION	12:30 PM			EASTERN REGIONAL OFFICE
DATE RECEIVED	7/10/79			AUG 3 1979
				MASS. DIVISION OF
COD	192			WATER POLLUTION CONTROL
BOD	51			
pH	7.4			
ALKALINITY, TOTAL	240			
SUSPENDED SOLIDS	26			
TOTAL SOLIDS	618			
TOTAL VOLATILE SOLIDS	108			
IRON	12			
CHROMIUM	0.04			
TOTAL KJELDAHL - N				
AMMONIA - N	23			
NITRATE - N	0.4			
TOTAL P				
TOTAL COLIFORM				
FECAL COLIFORM				
CHLORIDE				
MANGANESE	1.8			
SULFATE	7			

NE

DIVISION OF ENVIRONMENTAL QUALITY ENGINEERING

LAWRENCE EXPERIMENT STATION

WASTE WATER ANALYSIS (mg. per liter)

Collector:

TEWKSBURY

Hickerson

SOURCE A Tewksbury, Sutton Brook - South Street, Leachate

SOURCE B

SOURCE C

SOURCE D

SOURCE E

SOURCE F

DEPT. OF ENVIRONMENTAL
QUALITY ENGINEERING

	A	B	C	D	E	F
SAMPLE NO.	R76834					
DATE OF COLLECTION	6/26/72					
TIME OF COLLECTION	GPAB					
DATE RECEIVED	6/26/72					
COD	135					
BOD						
pH	7.1					
ALKALINITY, TOTAL	155					
SUSPENDED SOLIDS						
TOTAL SOLIDS	380					
TVS	106					
CONDUCTIVITY	560					
TOTAL KJELDAHL - N						
AMMONIA - N	10					
NITRATE - N	0.1					
TOTAL P						
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE						
IRON	12					
MANGANESE	1.4					

August 1982

5

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL QUALITY ENGINEERING

SPECIAL ANALYSIS

SOURCE A Wilmington Stream Culvert Stage 2 CITY/TOWN Tewksbury Evid.
 SOURCE B Tewksbury Stream Culvert @ S/S Springfield COLLECTOR Madrox
 SOURCE C " S.W. of old covered landfill area
 SOURCE D " Brook of Zuma Circle
 SOURCE E
 SOURCE F

	① A	② B	③ C	④ D	E	F
SAMPLE NUMBER	891510	891511	891512	891513	891514	
DATE OF COLLECTION	8/5	—————	—————	—————		
DATE OF RECEIPT	8/5	—————	—————	—————		
DATE ANALYZED						
Nickel	✓ 0.00	0.00	0.00	0.00		
Lead	✓ 0.00	0.00	0.00	0.00		
Cadmium	✓ 0.01	0.00	0.00	0.00		
Copper	✓ 0.00	0.00	0.00	0.00		
—————						
—————						
—————						
—————						
—————						
—————						
—————						
—————						
—————						
—————						

REMARKS

LAWRENCE EXPERIMENT STATION
WASTE WATER ANALYSIS
(md. per liter)

WILMINGTON/TEWKSBURY

Collector:

Maddox

AUG 16 1982

SOURCE A 1 Wilmington, Culvert at Rte. 93
SOURCE B 2 Tewksbury, Rocco's Landfill upstream
SOURCE C 3 " Brook at South Street
SOURCE D
SOURCE E
SOURCE F

	A	B	C	D	E	F
SAMPLE NO.	R91494	R91495	R91496			
DATE OF COLLECTION	8/4/82----->					
TIME OF COLLECTION	1025	1100	1110			
DATE RECEIVED	8/4/82----->					
DO	98	74	64			
BOD	10	3.0	14			
	6.7	6.5	7.6			
ALCALINITY, TOTAL	25	10	90			
SUSPENDED SOLIDS						
TOTAL SOLIDS	300	190	340			
TVS	150	140	160			
NICKEL	0.00					
CADMIUM	0.00					
TOTAL NITROGEN - N	2.8	1.7	11			
AMMONIA - N	0.14	0.29	5.9			
CHROMIUM	0.00					
NITRATE - N	0.51	0.1	0.1			
TOTAL P	0.41	0.28	0.31			
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE	55	60	55			
SP. COND.	270	110	380			
LEAD	0.01					



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering
Lawrence Experiment Station

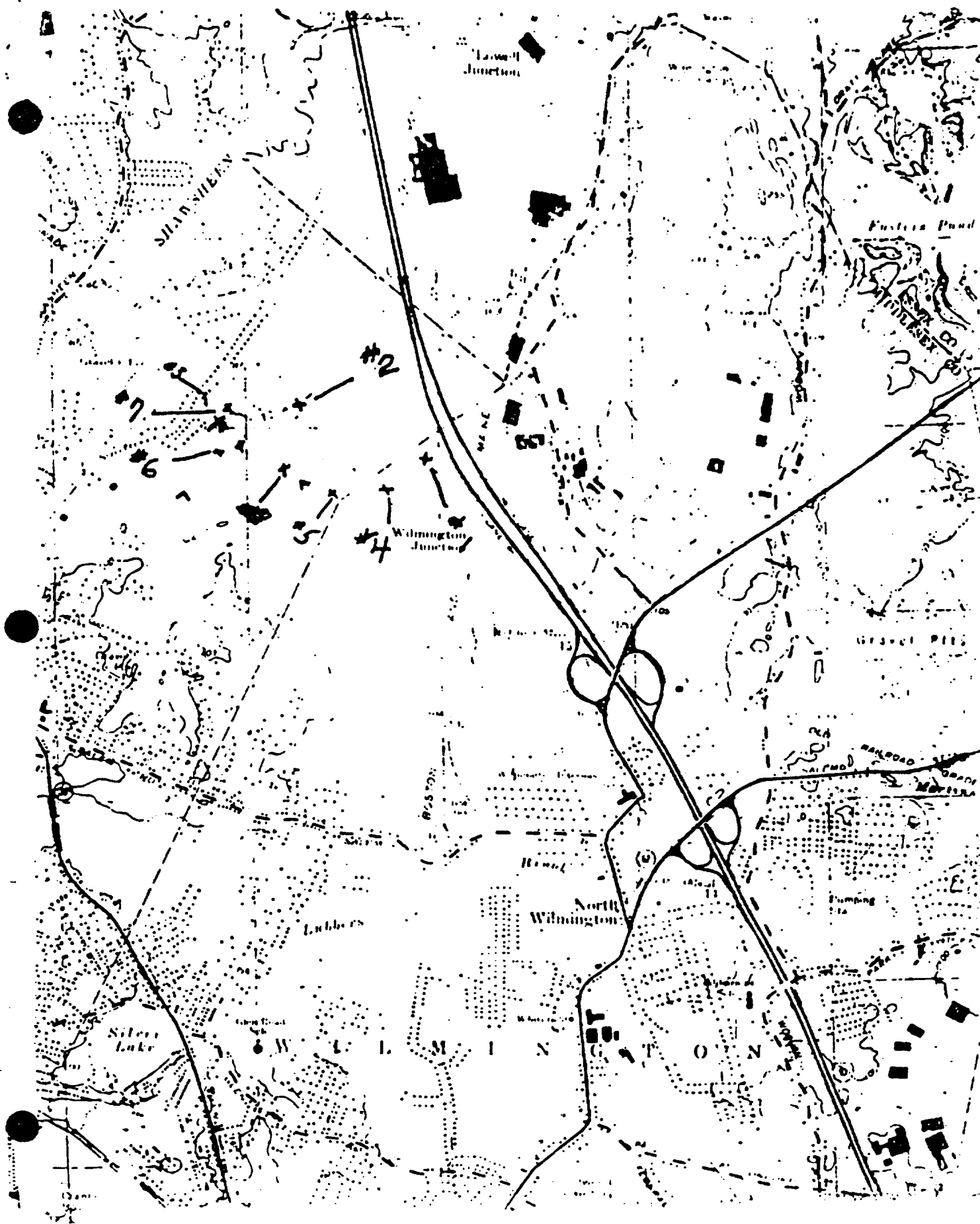
37 Thelluck Street, Lawrence, Massachusetts 01843

BACTERIAL EXAMINATION OF WATER

Collected 8/4
Received 8/4

By Maddox
Reported Aug. 10, 1982

Sample From	Sample Number	Membrane Filter Count per 100 ML		Multitube MPN per 100 ML	
		Coliform	Bkgd	Total Coliform	Fecal Coliform
Woo's Landfill					
ter Survey Stream	670,792			9300	9300
Wilmington Culvert at Rt 93	793			4600	1400
ok at South St.	794			930	430



6/7 + 6/10/82
Samples
Wilmington + Tewksbury

- Set #1 - Wilmington @ culvert @ Rt #93
- Set #2 - Tewksbury @ stream upstream
of Rocco's Landfill
- Set #3 ^{Tewksbury} - Brook @ South St downstream
of Rocco's L.F.
- Set #4 - Wilmington - culvert at Stage Coach Rd
- Set #5 - Tewksbury - culvert s/s landfill
- Set #6 - Tewksbury - stream adjacent to old
covered landfill
- Set #7 - Tewksbury - stream behind Benis Court

June 24, 1983



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering

Lawrence Experiment Station

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS
OF PURGEABLE ORGANICS

AUG 2 1983

SAMPLE NUMBER 009902 CITY/TOWN TEWKSBURY
COLLECTOR St. Hilaire/Maddox COLLECTED June 24, 1983
RECEIVED June 24, 1983 ANALYZED July 7, 1983
SOURCE Rocco's Landfill - R.R. bed at culvert - upstream

APPROVED BY *[Signature]*

☒ No purgeable organic compounds detected.

	ug/l		ug/l

The sample was analyzed according to the EPA procedure, "Method 624-Organics by Purge and Trap". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

L1 = less than 1.0 ug/l L5 = less than 5.0 ug/l L10 = less than 10 ug/l

No standard available for quantitation. The mass spectrum obtained was compared to a mass spectral index and a mass spectral data base for identification.

REMARKS:

I, Dr. John E. Delaney, Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above sample.

Copy of MAN

*Then personally appeared before me John E. Delaney
was made oath to the truth of the statements
contained herein. April 17, 1983. Ann Marie Allen
Notary Public
my Comm. Exp. 12/31/83*

John E. Delaney 4/13/87
Date



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering
Lawrence Experiment Station

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS AUG 2 1983
OF PURGEABLE ORGANICS

SAMPLE NUMBER	009903	CITY/TOWN	TEWKSBURY
COLLECTOR	St. Hilaire/Maddox	COLLECTED	June 24, 1983
RECEIVED	June 25, 1983	ANALYZED	July 7, 1983
SOURCE	Rocco's landfill - 50' upstream culvert between landfill		

APPROVED BY jeep

☐ No purgeable organic compounds detected.

	ug/l		ug/l
Fluorochloromethane	*	Isopropyl benzene	*
Tetrahydrofuran	*		
Diethyl ether	*		
Methyl ethyl ketone	26		
Benzene	7.6		
Toluene	14		
Chlorobenzene	3.7		
Ethyl benzene	74		
Xylenes	210		
Acetone	77		

The sample was analyzed according to the EPA procedure, "Method 624-Organics by Purge and Trap". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

L1 = less than 1.0 ug/l L5 = less than 5.0 ug/l L10 = less than 10 ug/l

*No standard available for quantitation. The mass spectrum obtained was compared to a mass spectral index and a mass spectral data base for identification.

REMARKS: I, Dr. John E. Delaney, Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above sample.

Handwritten notes:
The original copy of the report is in the file of the Lawrence Experiment Station.
John E. Delaney, Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above sample.
Date: 4/13/87
Signature: John E. Delaney
Notary Public: John E. Delaney, 246 Commonwealth Ave., 2nd Fl., Boston, MA 02116

The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering

Lawrence Experiment Station

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS AUG 2 1983
OF PURGEABLE ORGANICS

SAMPLE NUMBER	<u>009904</u>	CITY/TOWN	<u>TEWKSBURY</u>
COLLECTOR	<u>St. Hilaire/Maddox</u>	COLLECTED	<u>June 24, 1983</u>
RECEIVED	<u>June 24, 1983</u>	ANALYZED	<u>July 7, 1983</u>
SOURCE	Rocco's Landfill - Leachate @ Horseshoe		

APPROVED BY

☐ No purgeable organic compounds detected.

	ug/l	ug/l
Chloroethane	*	-
Acetone	360	
Tetrahydrofuran	*	
Isopropanol	*	
Methyl ethyl ketone	220	
Methyl isobutyl ketone	18	
Methyl butanone	*	

The sample was analyzed according to the EPA procedure, "Method 624-Organics by Purge and Trap". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

L1 = less than 1.0 ug/l L5 = less than 5.0 ug/l L10 = less than 10 ug/l

*No standard available for quantitation. The mass spectrum obtained was compared to a mass spectral index and a mass spectral data base for identification.

REMARKS: I, Dr. John E. Delaney, Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above sample.

James M. Smith

That personally interviewed John E. Doherty
 made OOR to 72nd part of the statement
 become and contacted him
 June 13, 1961, page
 Ray Morris Allen
 District Subil. My commission expires 12/1/61.



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering
Lawrence Experiment Station

GAS CHROMATOGRAPHY-MASS SPECTROMETRY ANALYSIS
OF PURGEABLE ORGANICS

AUG 2 1983

SAMPLE NUMBER 009905 CITY/TOWN TEWKSBURY
COLLECTOR St. Hilaire/Maddox COLLECTED June 24, 1983
RECEIVED June 24, 1983 ANALYZED July 7, 1983
SOURCE Rocco's Landfill - culvert at Old Garage Road, downstream
of R. R. bed.

APPROVED BY

J.P.

☐ No purgeable organic compounds detected.

	ug/l		ug/l
No purgeable organic compounds	were	observed during analysis.	The
laboratory was not able to obtain a	permanent copy of the analysis		
and the duplicate broke due to	freezing.		

The sample was analyzed according to the EPA procedure, "Method 624-Organics by Purge and Trap". Only those organic compounds which have a significant vapor pressure in aqueous solution at room temperature and thus are amenable to partition by purging are detected by this procedure.

L1 = less than 1.0 ug/l L5 = less than 5.0 ug/l L10 = less than 10 ug/l

No standard available for quantitation. The mass spectrum obtained was compared to a mass spectral index and a mass spectral data base for identification.

REMARKS: I, Dr. John E. Delaney, Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above sample.

Commonwealth of Massachusetts
Board of
John E. Delaney before me and *V.S. G.H.*

(mg. per liter)

Collector: Maddox/St. J. Laire

SOURCE A Rocco's Landfill, R.R. bed At Culvert Upstream SLF No. 1
 SOURCE B " " No 7 Leachate At Horseshoe
 SOURCE C " " 50 Feet Upstream Culvert Between Landfill No. 5
 SOURCE D " " Culvert at Old Garage Road, Downstream From R.R. bed No. 8
 SOURCE E
 SOURCE F

I, Dr. John E. Delaney Chief of the Lawrence Experiment Station and Keeper of the Records of this laboratory, certify that this is a true copy of the analytical results generated on the above samples.

John E. Delaney 4/13/81
 Date

	A	B	C	D	E	F
SAMPLE NO.	R94237	R94238	R94239	R94240		
DATE OF COLLECTION	6/24/83					
TIME OF COLLECTION	3:15	3:30	3:45	4:00		
DATE RECEIVED 4:35	6/24/83					
TURBIDITY	33	589	329	148		
SSB CALCIUM	9.3	160	69	46		
SSB MAGNESIUM	2.4	46	38	8.1		
PH	7.1	6.6	6.7	7.5		
ALKALINITY, TOTAL						
SP. COND	227	1,525	3,100	738		
SUSPENDED SOLIDS						
MANGANESE	0.94	11	1.6	1.3		
IRON-ARSENITE-IRON	2.7	71	6.9	4.0		
SODIUM	26	140	250	65		
POTASSIUM	1.3	34	140	34		
COPPER	0.00	0.00	0.00	0.00		
TOTAL KIELDAHL - N						
ARSENITE → LEAD	0.02	0.03	0.07	0.00		
CHROMIUM	0.00	0.00	0.00	0.00		
ARSENITE → ARSENIC	0.009	0.015	0.012	0.110		
TOTAL P						
TOTAL COLIFORM						
FECAL COLIFORM						
CHLORIDE						
Commonwealth of Massachusetts				Exhibit 1.5		
Then personally captured upon re John E. Delaney with me						
ack to the truth of the statement contained herein April 13, 1987						
				Ann Marie Allen		
				Victory Public		

My Commission expires March 12, 1988

March 10, 1988

APR 7 - 1954
DEDE
DOUSWASIE

COLLECTOR W. Sirull

As 4/4/33

SOURCE F

[illegible]

REMARKS: The samples were analyzed.



The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering
Laurence Experiment Station
37 Phalluck Street, Laurence, Massachusetts 01843

RECEIVED
7 - 1988
DEQE
HAZARDOUS WASTE

PAGE 2 OF 2

SAMPLE

COLLECTOR Sirull
RECEIVED 3/16/88

CITY/TOWN TEWKSBURY
COLLECTION DATE 3/10/88
ANALYZED 3/17-3/25/88

414195

1. SAMPLE NO. 029418
SOURCE Rocco Landfill ID# 031088-1
RESULT The sample seems to contain a kerosene.

MARK: The sample was extracted with pentane prior to gas

During the March 10, 1988 inspection, MA DEQE officials also found two old but clearly labeled steel drums; an empty 30-gallon drum and a 55-gallon chemical drum labeled "poison" and "flammable". The chemical drum contained approximately 10 gallons of "rusty water". An onsite, DHW-Enforcement division official determined this chemical drum had originally contained Epichlorohydrin (Chloro Epoxy Propane), an extremely water-reactive chemical (MA DEQE 1988a).

A sludge sample was taken onsite on March 10, 1988 by a DHW-Enforcement officer and sent to the Lawrence Experimental Station for analysis. Results of the analysis found the sample to contain 400 micrograms/gram of total petroleum hydrocarbons. The lab analysis also indicated that the sample seemed to contain a kerosene" (MA DEQE 1988b).

Information pertaining to exact hazardous waste quantities, years of disposal, or area of disposal could not be found in the available file information.

NUS/FIT conducted a reconnaissance and sample collection event at the Rocco's Disposal Area on October 26, 1989 under the direction of the US EPA (NUS/FIT 1989a).

Four CERCLA sites and approximately 60 listed RCRA notifiers (storage) are located within the Town of Tewksbury. One CERCLA site is located within a 2-mile radius of Rocco's Disposal (U.S. EPA 1990a, 1990b).

ENVIRONMENTAL SETTING

Land use within 0.5 miles of Rocco's Disposal is primarily residential. A piggery is located adjacent to the northern corner of the property. The nearest occupied residence is located on the property (NUS/FIT 1989a). The nearest private well location and exact distance from the disposal area is not known but is estimated to be within 0.25 miles.

Portions of the towns of Wilmington, Burlington, North Reading, Reading, and Billerica are located within a 4-mile radius of Rocco's Disposal (USGS 1979; USGS 1979a; USGS 1979b; USGS 1979c). The overburden in this area consists of kame terrace deposits which are generally comprised of well-sorted sand and pebbles to cobble gravel (Castle 1959).

The depth to bedrock is approximately 35 feet (Delaney 1981). The bedrock consists of Andover Granite which is comprised of a light medium gray, foliated, medium to coarse grained, muscovite-biotite granite (Zen 1983). The depth to the water table is approximately 6 feet (Delaney 1981). The total number of people who rely on

M E M O R A N D U M

SUBJECT: Air Monitoring at Rocco Landfill - Tewksbury

TO: David Adams, Northeast Region

THRU: Don Steele, ASES *WBS*

FROM: Thomas McGrath, ASES *in*

DATE: March 25, 1988

The Air Quality Surveillance Branch conducted a preliminary air monitoring survey during a site investigation at the closed Rocco Landfill on South Street in Tewksbury on March 10, 1988. The monitoring was performed at the request of the Northeast Region. DEQE representatives on the site included David Adams of the Northeast Region, Bill SIFORD of the Boston Office (DHW) and Tom McGrath of the Tewksbury Office.

AIR SAMPLING

After gaining entry on to the site at approximately noon, the writer conducted a general survey with a Photovac TIP photoionization detector (PID). The objective was to accompany the investigators and take whole air grab samples in areas where elevated readings were noted. Although difficulties were encountered obtaining stable readings from the TIP, elevated measurements were noted at some locations. Evacuated bottle whole air grab samples were taken at five of these locations.

The wind on this day was from the northwest. Soon after entry, Sample A was taken on the access road on the right side of the landfill dome (tracing the landfill from South Street), where a burnt odor and slight, elevated PID readings were recorded. Sample B was taken in the vicinity of piles of material, which were tentatively identified as sewage sludge. Sample C was taken on top of the landfill dome where elevated PID measurements were recorded and where a chemical odor was observed. Sample D was taken on the access road on the left side of the landfill, where elevated TIP readings were also noted. A fifth sample (Sample E) was taken at the entrance of the bung hole on an empty 55 gallon drum. A very high photoionization detector reading was observed at the bung hole.

RESULTS/FINDINGS

Listed below are the results of the analysis of the five (5) whole air grab samples. These samples were analyzed using a Photovac 10A10 photoionization detector-portable gas chromatograph. Compounds preliminarily identified included acetone, benzene, methylethyl ketone, toluene, trichloroethylene and xylene. Because of the instrument configuration, it was not possible to accurately quantify levels of acetone. An estimate would be in the several hundred parts per billion range in each sample. Methylisobutyl ketone also appear to be present in several samples. Only analysis using a gas chromatograph-mass spectrometer would

conclusively identify volatile organic compounds in air samples. The writer has more confidence in the identification of aromatic (benzene, toluene and xylene) and chlorinated (trichloroethylene) compounds using the portable gas chromatograph than the ketones (acetone, MEK and MIBK).

Concentrations (parts per billion)

Sample ID	Location	Acetone	Benzene	MEK	MIBK	Toluene	TCE	Xylene
A	Access Rd (Right)	U	1	22	U	53	15	35
B	Near Sludge Pile	I	1	NI	U	334	15	35
C	Landfill Core	I	NI	U	NI	14	14	11
D	Access Rd (Left)	U	1	NI	NI	61	17	29
E	Entrance of Drum Bung Hole	I	1	U	NI	14	13	NI

Note: TCE = trichloroethylene MEK = methylethyl ketone MIBK = methyl ethylbutyl ketone U = probable identification I = identified but not quantifiable NI = not identified

CONCLUSIONS/RECOMMENDATIONS

The identification of benzene, toluene and xylene in grab samples taken in the vicinity of landfills and other sources of volatile organic compounds is ~~common~~. Detecting high (albeit unquantified) levels of acetone and uniform (approximately 15 ppb) levels of trichloroethylene is less common. Experience has shown that the detected volatile organic compounds are not the likely cause of any observed odors in the neighborhood, nor is the exact chemical cause of such odors likely to be identified.

Air ~~monitoring~~ conducted at this site was preliminary in nature, but findings did indicate the presence of some volatile organic compounds in the air. The site visit revealed the presence of different types of waste at various locations throughout the landfill. I recommend that adsorbent trap samples be taken at various locations in and around the landfill and that samples be analyzed using our gas chromatograph-mass spectrometer at Lawrence Experiment Station. I believe that the focus of such a study should be to determine the potential of this landfill to emit contaminants into the ambient air. Further ambient monitoring in the neighborhood would then be considered if the results of this study indicate the need.

Considering the resources which will be required for the recommended study, I suggest that the Northeast Region contact Sarah Simon and/or Don Steele of DAQC to obtain their concurrence with this course of action. Please contact the writer if you have any comments or questions on this report or if you would like to discuss recommendations in more detail.

cc: Sarah Simon, DAQC
James Ellis, Northeast Region

October 26, 1989



19 CROSBY DRIVE
BEDFORD, MASSACHUSETTS 01730
617-275-2970

REGION 1 FIT/EPA CORRESPONDENCE

C-583-11-9-134

TO: DON SMITH/EPA

FROM: JOHN F. KELLY *JFK*

SUBJECT: TRIP REPORT/ ONSITE RECONNAISSANCE,
SOIL/SEDIMENT AND LEACHATE SAMPLING
ROCCO'S DISPOSAL AREA
TEWKSBURY, MASSACHUSETTS
TDD No. FI-8804-07
Reference No. S375MAE6\$11
CERCLIS No. MAD980520696

DATE: NOVEMBER 15, 1989

COPIES: FILE
J. PILLION
M. NALIPINSKI/EPA (1c)
P. MULLIAN/MADEQE (2c)

On Thursday, October 26, 1989, NUS/FIT personnel conducted an onsite reconnaissance, soil/sediment and leachate sampling of the Rocco's Disposal Area in Tewksbury, Massachusetts.

NUS/FIT personnel present during the field operation were John F. Kelly, Tony Davis, Janet Pillion, Ken Leach, Tom Barrasso, Gina Oliverio, John Weiss, Dan Taylor, and Paul Young. NUS/FIT personnel were joined by Mike Nalipinski /EPA, Richard McCalister /EPA Lawyer, and Matt Schweisberg/EPA Wetlands Department.

All work was conducted in accordance with the reviewed and approved Task Work Plan No. D-583-10-9-2, revision 2. Sample locations chosen in the field varied slightly from the Task Work Plan due to accessibility and local contamination potential (Figure 1).

All soil and sediment samples were collected for full organic and inorganic analysis through the Contract Laboratory Program, except for SS-11, the screening blank which was not analyzed for inorganic elements. All soil, sediment and leachate samples collected will also be analyzed qualitatively for volatile organics compounds through the NUS/FIT Field Analytical Screening Program (FASP) (Table 1).

Approval: *B. Felitti*
Barbara Felitti
Acting FIT Office Manager

JFK:ib

TABLE 1

Sample Summary: ROCCO'S DISPOSAL AREA
 Samples Collected by NUS/FIT on October 26, 1989.

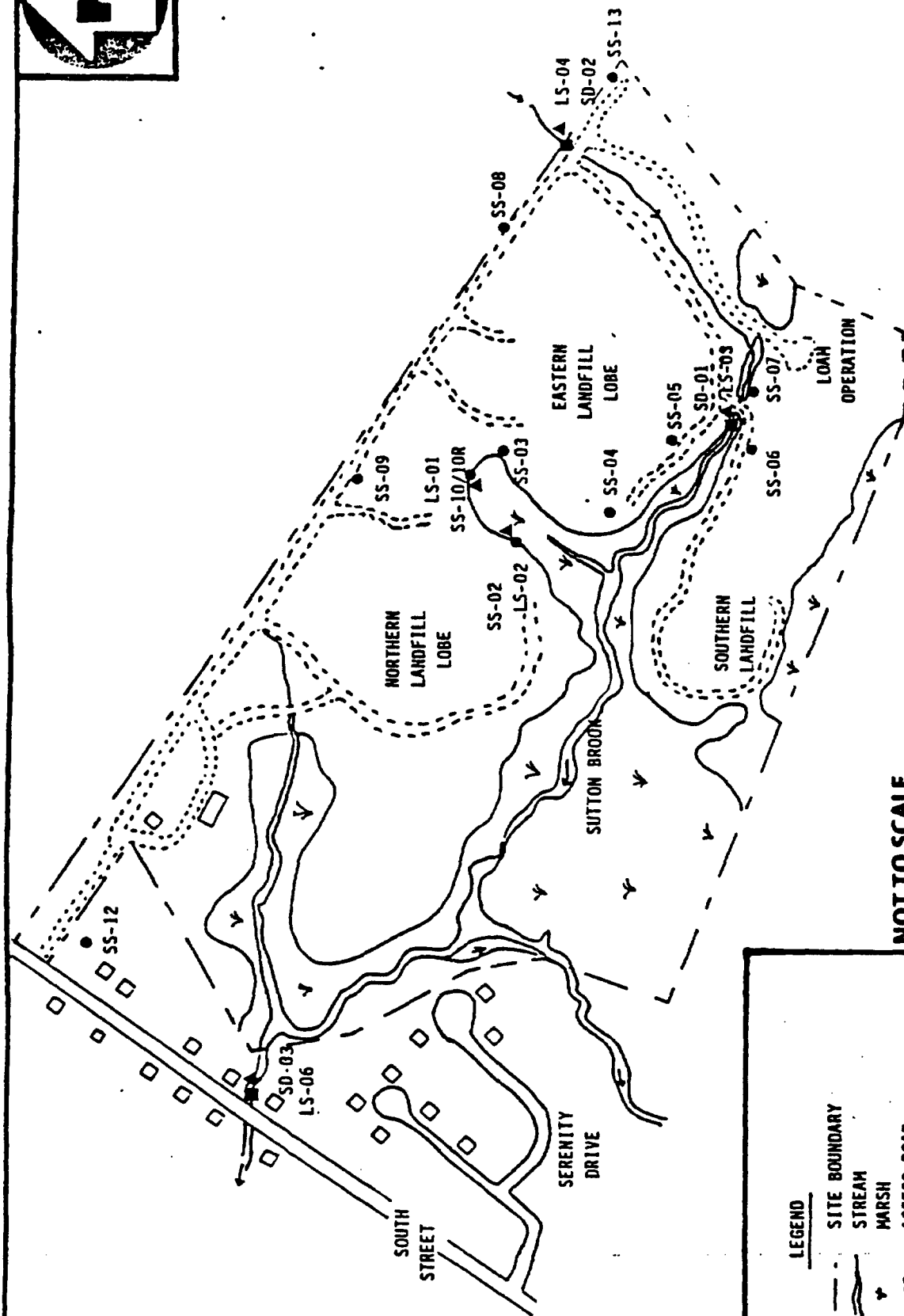
<u>Sample Location No.</u>	<u>NUS Sample Traffic Report #</u>	<u>Time(hrs)</u>	<u>Remarks</u>	<u>Sample Source</u>
Leachate:				
LS-01	22641	12:33	Grab Surface liquid	Near bubbling gas source, base of Northern landfill, northern point of Horseshoe wetlands area.
LS-02	22642	14:10	Grab Surface	Northwest side of Horseshoe wetlands liquid area, base of landfill.
LS-03	22643	13:49	Grab Surface liquid	Down stream (Sutton Brook) sample, 12 feet west of culvert.
LS-04	22644	13:18	Grab Surface liquid	Upstream (Sutton Brook) sample, northeast of Eastern landfill; northwest of access road to loam operation.
LS-05	22645	07:00	Grab	Blank aqueous sample, for QA/QC.
LS-06	22625	18:05	Grab Surface liquid	Offsite, downstream sample, 2 feet upstream from the intersection of Sutton Brook and South St.
Sediment:				
SD-01	22639 AR016 MAN126	13:49	Grab Surface Sediment	Down stream (Sutton Brook) sample, 12 feet west of culvert.

TABLE 1 (cont.)

<u>Sample Location No.</u>	<u>NUS Sample Traffic Report #</u>	<u>Time(hrs)</u>	<u>Remarks</u>	<u>Sample Source</u>
SD-02	22640 AR017 MAN122	13:18	Grab Surface Sediment	Upstream (Sutton Brook) sample, northeast of Eastern landfill; northwest of access road to loam operation.
SD-03	22625 AR002 MAN112	18:07	Grab Surface Sediment	Offsite, downstream sample, 2 feet upstream from the intersection of Sutton Brook and South St.
Soil:				
SS-02	22626 AR003 MAN113	14:10	Grab Depth 8"	Northwest side of Horseshoe wetlands area, base of Northern landfill.
SS-03	22627 AR004 MAN114	16:27	Grab Depth 8"	Beginning of stream flow, northeast section of Horseshoe wetlands area.
SS-04	22628 AR005 MAN115	15:07	Grab Depth 8"	Southeast section of Horseshoe wetlands, base of Eastern landfill.
SS-05	22629 AR006 MAN116	15:12	Grab Depth 10"	South-central section of Eastern landfill lobe, north of Sutton Brook, along access road.
SS-06	22630 AR007 MAN117	14:43	Grab Depth 5"	Sample along northern access road to Southern landfill lobe, directly south of Sutton Brook.
SS-07	22631 AR008 MAN118	16:02	Grab Depth 18"	Low-lying area, over bank, southeast of Sutton Brook culvert.

TABLE 1 (cont.)

<u>Sample Location No.</u>	<u>NUS Sample Traffic Report #</u>	<u>Time(hrs)</u>	<u>Remarks</u>	<u>Sample Source</u>
SS-08	22632 AR009 MAN119	13:08	Grab Depth 8"	Drainage ditch, north of central section of Eastern landfill lobe
SS-09	22633 AR010 MAN120	12:37	Grab Depth 2"	Base of northwest corner of Northern landfill lobe, south of access road.
SS-10	22634 AR011 MAN121	12:33	Grab Depth 4"	Near bubbling gas source, base of landfill, northern point of Horseshoe wetlands area.
SS-10R	22635 AR013 MAN123	12:35	Grab Depth 4"	Same as SS-10, for QA/QC.
SS-11	22636 AR012	07:00	Grab	Blank, for QA/QC.
SS-12	22637 AR014 MAN124	11:50	Grab Depth 8"	Offsite Background, southeastern edge of property, directly south of Rocco's access road and South Street intersection.
SS-13	22638 AR015 MAN125	12:33	Grab Depth 18"	Onsite Background, north east corner of Rocco's property, northeast of loam operation access road.



SITE SKETCH

ROCCO'S DISPOSAL AREA

TEWKSBURY, MASSACHUSETTS

FIGURE 1

LEGEND

- SITE BOUNDARY
- STREAM
- MARSH
- ACCESS ROAD
- HOUSE
- BUILDING
- SAMPLES
- SOIL - SS
- SEDIMENT - SD
- ▲ LEACHATE - LS

FIGURE 1

The surface water drainage pathway from Rocco's Disposal Area is south, toward Sutton Brook and associated wetlands. Sutton Brook flows along the southern border of the property and into the Shawsheen River which is located approximately 0.50 miles northwest of the disposal area. The Shawsheen River flows for approximately 9.86 miles north through the Towns of Tewksbury, Andover, and into Lawrence where it empties into the Merrimack River (USGS 1979). There are no surface water intakes downstream of Rocco's Disposal area along the Merrimack River (Taylor 1989). However, the Town of Andover has a well that serves approximately 135 people located along the banks of the Shawsheen. The well water is not treated or mixed with water from other sources prior to distribution (Dripps 1987; Kasten 1991). Rocco's Disposal is located in the 100-year flood plain (FEMA 1981). Total wetland frontage along the 15-mile surface water pathway is approximately 74.65 miles (U.S. DOI 1977, 1977a).

There are several reservation areas along the banks of the Shawsheen, including Hale Reservation (located approximately 3.45 stream miles north of Rocco's Disposal); Shawsheen River Reservation (located approximately 4.43 stream miles north of Rocco's Disposal); and Indian Ridge Reservation (located approximately 5.12 stream miles north of Rocco's Disposal); (USGS 1979). The Reservations are open to the public for hiking and picnicing (Chisholm 1991a). The Shawsheen is also stocked with trout for fishing and is used for canoeing when the water level is high enough (Kurpaska 1987).

The remainder of the 15-mile downstream path is along the Merrimack River from O'Reilly Bridge in Lawrence to the Rt. 495 overpass in Methuen (USGS 1979; USGS 1979c; USGS 1979d). The Merrimack is used for sailing, rowing, sculling, fishing, power boating, and jet skiing (Lord 1990).

RESULTS

On October 26, 1989, NUS/FIT personnel conducted an onsite reconnaissance and sampling round at Rocco's Disposal Area. NUS/FIT personnel collected 13 soil samples, including an onsite and offsite background soil sample, and a blank soil sample; three sediment samples, including a background sample, and six leachate samples (Table 5, Figure 2) (NUS/FIT 1989a). All soil and sediment samples were analyzed through the Contract Laboratory Program (CLP) for Superfund List organic compounds and inorganic elements (Attachment A and B). Leachate samples were analyzed through the NUS/FIT Volatile Organic Screening Program (Attachment C).

Note that the sample results and detection limits qualified by a "J" on the results tables are considered approximate due to limitations identified during the quality control review. It

TABLE 5

Sample Summary: ROCCO'S DISPOSAL AREA
 Samples Collected by NUS/FIT on October 26, 1989.

Sample Location No.	NUS Sample Traffic Report #	Time(hrs)	Remarks	Sample Source
Leachate:				
LS-01	22641	12:33	Grab Surface liquid	Near bubbling gas source, base of Northern landfill, northern point of Horseshoe wetlands area.
LS-02	22642	14:10	Grab Surface	Northwest side of Horseshoe wetlands liquid area, base of landfill.
LS-03	22643	13:49	Grab Surface liquid	Down stream (Sutton Brook) sample, 12 feet west of culvert.
LS-04	22644	13:18	Grab Surface liquid	Upstream (Sutton Brook) sample, northeast of Eastern landfill; northwest of access road to loam operation.
LS-05	22645	07:00	Grab	Blank aqueous sample, for QA/QC.
LS-06	22625	18:05	Grab Surface liquid	Offsite, downstream sample, 2 feet upstream from the intersection of Sutton Brook and South St.
Sediment:				
SD-01	22639 AR016 MAN126	13:49	Grab Surface Sediment	Down stream (Sutton Brook) sample, 12 feet west of culvert.

TABLE 5 (cont.)

<u>Sample Location No.</u>	<u>NUS Sample Traffic Report #</u>	<u>Time(hrs)</u>	<u>Remarks</u>	<u>Sample Source</u>
SD-02	22640 AR017 MAN122	13:18	Grab Surface Sediment	Upstream (Sutton Brook) sample, northeast of Eastern landfill; northwest of access road to loam operation.
SD-03	22625 AR002 MAN112	18:07	Grab Surface Sediment	Offsite, downstream sample, 2 feet upstream from the intersection of Sutton Brook and South St.
Soil:				
SS-02	22626 AR003 MAN113	14:10	Grab Depth 8"	Northwest side of Horseshoe wetlands area, base of Northern landfill.
SS-03	22627 AR004 MAN114	16:27	Grab Depth 8"	Beginning of stream flow, northeast section of Horseshoe wetlands area.
SS-04	22628 AR005 MAN115	15:07	Grab Depth 8"	Southeast section of Horseshoe wetlands, base of Eastern landfill.
SS-05	22629 AR006 MAN116	15:12	Grab Depth 10"	South-central section of Eastern landfill lobe, north of Sutton Brook, along access road.
SS-06	22630 AR007 MAN117	14:43	Grab Depth 5"	Sample along northern access road to Southern landfill lobe, directly south of Sutton Brook.
SS-07	22631 AR008 MAN118	16:02	Grab Depth 18"	Low-lying area, over bank, southeast of Sutton Brook culvert.

TABLE 5 (cont.)

<u>Sample Location No.</u>	<u>NUS Sample Traffic Report #</u>	<u>Time(hrs)</u>	<u>Remarks</u>	<u>Sample Source</u>
SS-08	22632 AR009 MAN119	13:08	Grab Depth 8"	Drainage ditch, north of central section of Eastern landfill lobe
SS-09	22633 AR010 MAN120	12:37	Grab Depth 2"	Base of northwest corner of Northern landfill lobe, south of access road.
SS-10	22634 AR011 MAN121	12:33	Grab Depth 4"	Near bubbling gas source, base of landfill, northern point of Horseshoe wetlands area.
SS-10R	22635 AR013 MAN123	12:35	Grab Depth 4"	Same as SS-10, for QA/QC.
SS-11	22636 AR012	07:00	Grab	Blank, for QA/QC.
SS-12	22637 AR014 MAN124	11:50	Grab Depth 8"	Offsite Background, southeastern edge of property, directly south of Rocco's access road and South Street intersection.
SS-13	22638 AR015 MAN125	12:33	Grab Depth 18"	Onsite Background, north east corner of Rocco's property, northeast of loam operation access road.

should also be noted that inorganic sample results qualified by a "UJ" signifies that the quantitation limit is approximate due to the limitations identified during the quality control review. Values rejected during the quality control review are denoted with a "R".

In addition to the complete analytical tables, a sample results summary table has been included (Table 6). Presented in this table are the compounds and elements which were detected in samples and whose concentrations are equal to or exceed 3 times the background sample concentration for that compound or element. However, if the element or compound was not detected in the background sample, then the background sample detection limit for that compound or element is used as a reference value. If the element or compound was not detected in the background sample and the concentration does not exceed 3 times the background sample detection limit, the element or compound is listed as being "Detected". The following discussion relates only to those analytical results which met the criteria to be included on Table 6.

Soil Sample Analytical Results

Volatile organic compounds (VOCs) were detected in samples from sample location SS-04, SS-09, SS-10, SS-10R and SS-11; there were no volatile organic compounds detected in the background sample. Concentrations of VOCs ranged from "Detected" to 69 times the background detection limit. Xylene concentrations ranged from greater than 14 times up to 69 times the background detection limit in samples, SS-04, SS-09, SS-10, and SS-10R. Toluene, chlorobenzene, and ethylbenzene were detected in samples at location SS-09, SS-10 and SS-10R. Benzene was detected in samples collected at both locations SS-09 and SS-10; 1,1,2,2-tetrachloroethane was detected from the sample collected at location SS-09.

Semi-volatile extractable organic compounds were detected in samples from all soil locations (SS-02, SS-03, SS-04, SS-05, SS-06, SS-07, SS-08, SS-09, SS-10, SS-10R and SS-12) except SS-13, the onsite background; there were 26 different extractable compounds detected at these sampling locations. Sample concentrations ranged from "Detected" to 11 times the background detection limit for bis(2-Ethylhexyl)phthalate at SS-10. Benzo(a)pyrene was detected at ten of the soil sample locations. Phenanthrene, fluoranthene, pyrene, chrysene, benzo(b)fluoranthene and benzo(k)fluoranthene were detected at nine of the soil sample locations. Benzo(a)anthracene, and bis(2-Ethylhexyl)phthalate were detected at eight sample locations. The remaining 17 semi-volatile extractable organic compounds were detected in no more than seven soil sample locations (Table 6).

Semi-volatile extractable organic compounds were detected in samples collected throughout the site; however the greatest

TABLE 6
SAMPLE RESULTS SUMMARY TABLE
ROCCO'S DISPOSAL AREA
SAMPLES COLLECTED OCTOBER 26, 1989

LOCATION	COMPOUND/ ELEMENT	CONCENTRATION		ATTACHMENT/ TABLE	COMMENT
SS-02	Naphthalene	15	J ppb	A 2	Detected
	2-Methylnaphthalene	5	J ppb	A 2	Detected
	Acenaphthylene	36	J ppb	A 2	Detected
	Acenaphthene	19	J ppb	A 2	Detected
	Dibenzofuran	10	J ppb	A 2	Detected
	Diethylphthalate	24	J ppb	A 2	Detected
	Fluorene	23	J ppb	A 2	Detected
	Phenanthrene	380	J ppb	A 2	Detected
	Anthracene	420	J ppb	A 2	Detected
	Di-n-butylphthalate	7	J ppb	A 2	Detected
	Fluoranthene	780	J ppb	A 2	Detected
	Pyrene	24	J ppb	A 2	Detected
	Butylbenzylphthalate	23	J ppb	A 2	Detected
	Benzo(a)anthracene	360	J ppb	A 2	Detected
	Chrysene	380	J ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	27	J ppb	A 2	Detected
	Benzo(b)fluoranthene	650	J ppb	A 2	Detected
	Benzo(k)fluoranthene	780	J ppb	A 2	Detected
	Benzo(a)pyrene	270	J ppb	A 2	Detected
	Indeno (1,2,3-cd)pyrene	130	J ppb	A 2	Detected
	Benzo(g,h,i)perylene	110	J ppb	A 2	Detected
	4,4'-DDE	30.0	J ppb	A 2	Detected
	4,4'-DDD	29.0	J ppb	A 2	Detected
	alpha-Chlordane	40.0	J ppb	A 2	Detected
	gamma-Chlordane	59.0	J ppb	A 2	Detected
	Barium	32.40	ppm	A 3	> 3x BKG*
	Calcium	3,450.00	J ppm	A 3	> 13x BKG#
	Cobalt	10.80	ppm	A 3	> 3x BKG #
	Copper	23.90	J ppm	A 3	> 7x BKG *
	Iron	21,200.00	ppm	A 3	> 4x BKG *
	Lead	34.90	ppm	A 3	> 4x BKG *
	Magnesium	4,060.00	ppm	A 3	> 3x BKG #
	Manganese	458.00	J ppm	A 3	> 5x BKG *
	Nickel	11.40	J ppm	A 3	Detected
	Selenium	2.60	J ppm	A 3	> 4x BKDL
	Sodium	249.00	J ppm	A 3	> 10x BKDL
	Zinc	76.60	J ppm	A 3	> 44x BKDL
SS-03	Naphthalene	350	J ppb	A 2	Detected
	Acenaphthene	70	J ppb	A 2	Detected
	Dibenzofuran	50	J ppb	A 2	Detected
	Fluorene	83	J ppb	A 2	Detected
	Phenanthrene	600	ppb	A 2	Detected
	Anthracene	160	J ppb	A 2	Detected
	Fluoranthene	760	ppb	A 2	Detected
	Pyrene	810	J ppb	A 2	Detected
	Benzo(a)anthracene	370	J ppb	A 2	Detected
	Chrysene	380	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	160	J ppb	A 2	Detected

Benzo(b)fluoranthene	420		ppb	A 2	Detected
Benzo(k)fluoranthene	310	J	ppb	A 2	Detected
Benzo(a)pyrene	370	J	ppb	A 2	Detected
Indeno(1,2,3-cd)pyrene	250	J	ppb	A 2	Detected
Benzo(g,h,i)perylene	240	J	ppb	A 2	Detected
Calcium	3,100.00	J	ppm	A 3	> 11x BKG#
Chromium	48.40		ppm	A 3	> 6x BKG #
Copper	11.20	J	ppm	A 3	> 3x BKG *
Lead	26.30		ppm	A 3	> 3x BKG *
Sodium	139.00		ppm	A 3	> 6x BKDL
Zinc	34.90	J	ppm	A 3	> 23x BKDL

SS-04	Xylene (Total)	140		ppb	A 1	> 14x BKDL
	Naphthalene	47	J	ppb	A 2	Detected
	Phenanthrene	57	J	ppb	A 2	Detected
	Anthracene	57	J	ppb	A 2	Detected
	Fluoranthene	140	J	ppb	A 2	Detected
	Pyrene	130	J	ppb	A 2	Detected
	Benzo(a)anthracene	77	J	ppb	A 2	Detected
	Chrysene	80	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	96	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	80	J	ppb	A 2	Detected
	Benzo(a)pyrene	82	J	ppb	A 2	Detected
	Indeno(1,2,3-cd)pyrene	60	J	ppb	A 2	Detected
	4,4'-DDE	39.0	J	ppb	A 2	Detected
	Calcium	4,410.00	J	ppm	A 3	> 16x BKG#
	Chromium	785.00		ppm	A 3	> 98x BKG#
	Copper	27.90	J	ppm	A 3	> 9x BKG *
	Lead	37.90		ppm	A 3	> 4x BKG *
	Sodium	31.80	J	ppm	A 3	Detected
	Zinc	129.00	J	ppm	A 3	> 84x BKDL

SS-05	Phenanthrene	52	J	ppb	A 2	Detected
	Fluoranthene	140	J	ppb	A 2	Detected
	Pyrene	130	J	ppb	A 2	Detected
	Benzo(a)anthracene	78	J	ppb	A 2	Detected
	Chrysene	75	J	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	370	J	ppb	A 2	Detected
	Di-n-octyl phthalate	54	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	110	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	72	J	ppb	A 2	Detected
	Benzo(a)pyrene	89	J	ppb	A 2	Detected
	Indeno(1,2,3-cd)pyrene	55	J	ppb	A 2	Detected
	Benzo(g,h,i)perylene	51	J	ppb	A 2	Detected
	Calcium	1,110.00	J	ppm	A 3	> 4x BKG#
	Nickel	10.00	J	ppm	A 3	Detected
	Sodium	52.20		ppm	A 3	Detected
	Zinc	44.00	J	ppm	A 3	> 17x BKDL

SS-06	Phenanthrene	63	J	ppb	A 2	Detected
	Fluoranthene	170	J	ppb	A 2	Detected
	Pyrene	140	J	ppb	A 2	Detected
	Chrysene	83	J	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	490		ppb	A 2	Detected
	Di-n-octyl phthalate	79	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	93	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	85	J	ppb	A 2	Detected

	Benzo(a)pyrene	87	J	ppb	A 2	Detected
	gamma-BHC (Lindane)	8.9	J	ppb	A 2	Detected
	4,4'-DDE	9.1	J	ppb	A 2	Detected
	gamma-Chlordane	3.9	J	ppb	A 2	Detected
	Barium	34.30		ppm	A 3	> 3x BKG*
	Calcium	858.00	J	ppm	A 3	> 3x BKG#
	Copper	35.70	J	ppm	A 3	> 11x BKG*
	Lead	371.00	J	ppm	A 3	> 45x BKG*
	Nickel	7.90	J	ppm	A 3	Detected
	Zinc	44.00		ppm	A 3	> 32x BKDL
SS-07	2,4-Dichlorophenol	78	J	ppb	A 2	Detected
	Benzo(a)pyrene	150	J	ppb	A 2	Detected
	Calcium	1,360.00	J	ppm	A 3	> 6x BKG#
	Sodium	104.00		ppm	A 3	> 4x BKDL
SS-08	Phenanthrene	230	J	ppm	A 2	Detected
	Fluoranthene	300	J	ppb	A 2	Detected
	Pyrene	320	J	ppb	A 2	Detected
	Butylbenzylphthalate	69	J	ppb	A 2	Detected
	Benzo(a)anthracene	140	J	ppb	A 2	Detected
	Chrysene	150	J	ppb	A 2	Detected
	bis(2-Ethylhexyl) phthalate	1,200		ppb	A 2	Detected
	Di-n-octyl phthalate	180	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	200	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	110	J	ppb	A 2	Detected
	Benzo(a)pyrene	150	J	ppb	A 2	Detected
	Benzo(g,h,i)perylene	130	J	ppb	A 2	Detected
	Aroclor-1242	2,500.0		ppb	A 2	> 4x BKDL
	Calcium	1,710.00	J	ppm	A 3	> 6x BKG#
	Copper	27.90	J	ppm	A 3	> 9x BKG *
	Lead	48.90		ppm	A 3	> 6x BKG *
	Sodium	79.70		ppm	A 3	> 3x BKDL
	Zinc	87.60	J	ppm	A 3	> 52x BKDL
SS-09	Benzene	7	J	ppb	A 1	Detected
	Toluene	11	J	ppb	A 1	Detected
	Chlorobenzene	12	J	ppb	A 1	Detected
	Ethylenebenzene	450		ppb	A 1	> 13x BKDL
	Xylene (Total)	2,300	J	ppb	A 1	> 69x BKDL
	Naphthalene	1,400	J	ppb	A 2	Detected
	2-Methylnaphthalene	710	J	ppb	A 2	Detected
	Acenaphthene	2,300	J	ppb	A 2	Detected
	Dibenzofuran	1,300	J	ppb	A 2	Detected
	Fluorene	2,300	J	ppb	A 2	Detected
	Phenanthrene	17,000		ppb	A 2	> 4x BKDL
	Anthracene	5,000		ppb	A 2	Detected
	Fluoranthene	24,000		ppb	A 2	> 5x BKDL
	Pyrene	29,000		ppb	A 2	> 6x BKDL
	Butylbenzylphthalate	480	J	ppb	A 2	Detected
	Benzo(a)anthracene	10,000		ppb	A 2	Detected
	Chrysene	11,000		ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	760	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	12,000		ppb	A 2	Detected
	Benzo(k)fluoranthene	6,800		ppb	A 2	Detected
	Benzo(a)pyrene	9,500		ppb	A 2	Detected
	Indeno(1,2,3-cd)pyrene	5,200		ppb	A 2	Detected

Dibenz(a,h)anthracene	780	J	ppb	A 2	Detected
Benzo(g,h,i)perylene	4,700		ppb	A 2	Detected
Aroclor-1254	500.0	J	ppb	A 2	Detected
Barium	167.00		ppm	A 3	> 18x BKG*
Calcium	19,700.00	J	ppm	A 3	> 74x BKG#
Chromium	25.40		ppm	A 3	> 3x BKG#
Cobalt	11.60		ppm	A 3	> 3x BKG #
Copper	58.90	J	ppm	A 3	> 19x BKG*
Iron	25,000.00		ppm	A 3	> 5x BKG *
Lead	325.00		ppm	A 3	> 40x BKG*
Magnesium	4,610.00		ppm	A 3	> 3x BKG #
Manganese	305.00	J	ppm	A 3	> 3x BKG *
Mercury	0.23		ppm	A 3	Detected
Nickel	59.60		ppm	A 3	> 8x BKDL
Potassium	2,660.00		ppm	A 3	> 10x BKG*
Sodium	516.00		ppm	A 3	> 23x BKDL
Vanadium	275.00		ppm	A 3	> 29x BKG#
Zinc	188.00	J	ppm	A 3	> 117x BKDL

SS-10

Benzene	4	J	ppb	A 1	Detected
Toluene	4	J	ppb	A 1	Detected
Chlorobenzene	25		ppb	A 1	Detected
Ethylbenzene	350	J	ppb	A 1	> 29x BKDL
Xylene (Total)	310		ppb	A 1	> 25x BKDL
Naphthalene	1,300		ppb	A 2	Detected
2-Methylnaphthalene	290	J	ppb	A 2	Detected
Acenaphthene	530	J	ppb	A 2	Detected
Dibenzofuran	210	J	ppb	A 2	Detected
Fluorene	250	J	ppb	A 2	Detected
Phenanthrene	670	J	ppb	A 2	Detected
Anthracene	130	J	ppb	A 2	Detected
Fluoranthene	940		ppb	A 2	Detected
Pyrene	1,100		ppb	A 2	Detected
Benzo(a)anthracene	410	J	ppb	A 2	Detected
Chrysene	440	J	ppb	A 2	Detected
bis(2-Ethylhexyl)- phthalate	9,400		ppb	A 2	> 11x BKDL
Di-n-octyl phthalate	2,500		ppb	A 2	> 3x BKDL
Benzo(b)fluoranthene	580	J	ppb	A 2	Detected
Benzo(k)fluoranthene	360	J	ppb	A 2	Detected
Benzo(a)pyrene	430	J	ppb	A 2	Detected
Indeno(1,2,3-cd)pyrene	220	J	ppb	A 2	Detected
Benzo(g,h,i)perylene	130	J	ppb	A 2	Detected
Aroclor-1254	610.0	J	ppb	A 2	Detected
Barium	47.50		ppm	A 3	> 5x BKG*
Calcium	1,760.00	J	ppm	A 3	> 6x BKG#
Chromium	31.70		ppm	A 3	> 3x BKG #
Copper	82.90	J	ppm	A 3	> 26x BKG*
Lead	187.00		ppm	A 3	> 23x BKG*
Nickel	20.30		ppm	A 3	Detected
Potassium	1,160.00	J	ppm	A 3	> 4x BKG#
Selenium	1.50	J	ppm	A 3	Detected
Sodium	177.00		ppm	A 3	> 8x BKDL
Zinc	234.00	J	ppm	A 3	> 143x BKDL

SS-10R/D

Toluene	3	J	ppb	A 1	Detected
Chlorobenzene	18		ppb	A 1	Detected
Ethylbenzene	200	J	ppb	A 1	> 22x BKDL
Xylene (Total)	220		ppb	A 1	> 24x BKDL

	1,4-Dichlorobenzene	270	J	ppb	A 2	Detected
	Naphthalene	1,600		ppb	A 2	> 3x BKDL
	2-Methylnaphthalene	380	J	ppb	A 2	Detected
	Acenaphthylene	64	J	ppb	A 2	Detected
	Acenaphthene	720		ppb	A 2	Detected
	Dibenzofuran	310	J	ppb	A 2	Detected
	Fluorene	330	J	ppb	A 2	Detected
	Phenanthrene	760		ppb	A 2	Detected
	Anthracene	110	J	ppb	A 2	Detected
	Fluoranthene	860		ppb	A 2	Detected
	Pyrene	890		ppb	A 2	Detected
	Butylbenzylphthalate	170	J	ppb	A 2	Detected
	Benzo(a)anthracene	370	J	ppb	A 2	Detected
	Chrysene	430	J	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	2,300		ppb	A 2	> 4x BKDL
	Di-n-octyl phthalate	220	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	430	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	320	J	ppb	A 2	Detected
	Benzo(a)pyrene	350	J	ppb	A 2	Detected
	Indeno(1,2,3-cd)pyrene	250	J	ppb	A 2	Detected
	Benzo(g,h,i)perylene	270	J	ppb	A 2	Detected
	Barium	48.70		ppm	A 3	> 5x BKG*
	Calcium	3,440.00	J	ppm	A 3	> 13x BKG#
	Copper	134.00	J	ppm	A 3	> 43x BKG*
	Lead	138.00		ppm	A 3	> 17x BKG*
	Nickel	17.40		ppm	A 3	Detected
	Potassium	1,060.00	J	ppm	A 3	> 4x BKG#
	Sodium	198.00		ppm	A 3	> 8x BKDL
	Zinc	168.00	J	ppm	A 3	> 98x BKDL
SS-11	Toluene	10		ppb	A 1	Detected
	Ethylbenzene	6	J	ppb	A 1	Detected
	Xylene	16		ppb	A 1	Detected
SD-01	Toluene	4	J	ppb	A 1	Detected
	Ethylbenzene	17		ppb	A 1	Detected
	Xylene (Total)	32		ppb	A 1	3x BKDL
	Fluoranthene	48	J	ppb	A 2	Detected
	Pyrene	58	J	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	570		ppb	A 2	Detected
	Di-n-octyl phthalate	360	J	ppb	A 2	Detected
	Calcium	3,320.00	J	ppm	A 3	> 5x BKG+
	Lead	25.10		ppm	A 3	> 8x BKG+
	Nickel	6.60	J	ppm	A 3	Detected
	Zinc	44.30		ppm	A 3	> 30x BKDL
SD-03	Phenanthrene	200	J	ppb	A 2	Detected
	Anthracene	49	J	ppb	A 2	Detected
	Fluoranthene	280	J	ppb	A 2	Detected
	Pyrene	200	J	ppb	A 2	Detected
	Benzo(a)anthracene	100	J	ppb	A 2	Detected
	Chrysene	110	J	ppb	A 2	Detected
	bis(2-Ethylhexyl)- phthalate	41	J	ppb	A 2	Detected
	Benzo(b)fluoranthene	87	J	ppb	A 2	Detected
	Benzo(k)fluoranthene	85	J	ppb	A 2	Detected
	Benzo(a)pyrene	80	J	ppb	A 2	Detected

4,4'-DDD	7.9	J	ppb	A	2	Detected
gamma-Chlordane	1.5	J	ppb	A	2	Detected
Copper	31.30	J	ppm	A	3	> 7x BKG+
Lead	18.00		ppm	A	3	> 6x BKG+
Zinc	25.70	J	ppm	A	3	> 14x BKDL

LS-01	1,1-Dichloroethene	<40	ppb	a	C	1	Detected
	trans-1,2-Dichloroethene	<40	ppb	a	C	1	Detected
	Benzene	32	ppb		C	1	Detected
	Trichloroethene	< 5	ppb		C	1	Detected
	Tetrachloroethene	< 5	ppb		C	1	Detected
	Chlorobenzene	12	ppb		C	1	Detected
	Ethylbenzene	<80	ppb	a	C	1	Detected
	m-Xylene	1,900	ppb		C	1	190x BKDL
	o-Xylene	<80	ppb	a	C	1	Detected
	6 UNKNOWN COMPOUNDS DETECTED						

LS-02 1 UNKNOWN COMPOUND DETECTED

LS-03	m-Xylene	10	ppb	a	C	1	Detected
	1 UNKNOWN COMPOUND DETECTED						

LS-04 1 UNKNOWN COMPOUND DETECTED

LS-05 BLANK - NO COMPOUNDS DETECTED

LS-06 1 UNKNOWN COMPOUND DETECTED

SS-	Soil sample
SD-	Sediment sample
LS-	Leachate sample
ppb	parts per billion
ppm	parts per million
BKG*	background sample concentration (SS-12)
BKG#	background sample concentration (SS-13)
BKG+	background sample concentration (SD-02)
BKDL	background sample detection limit
J	Sample result is consider approximate because of limitations identified during the quality control review.
Detected	Compound/Element was detected in the sample but was not in the background sample, concentration does not exceed three times the background detection limit.
a	Due to matrix interference, these are the lowest achievable detection limits for this sample.

concentration appears to be near the junction of the northern and eastern landfill lobes (SS-02, SS-09, SS-10 and SS-10R) (Figure 2). The sample collected from location SS-07, the southeastern-most sample location, contained the fewest semi-volatile compounds with the exception of the two background locations (SS-12 and SS-13).

Nine different pesticide and PCB compounds were detected at locations throughout the site; concentrations ranged from "Detected" to greater than 4 times the background detection limit (Aroclor-1242 at location SS-08). The pesticide 4,4-DDE was detected in the samples collected from sample locations SS-02, SS-04, and SS-06. Gamma-chlordane and Aroclor-1254 were detected in two sample locations (SS-02 and SS-06; SS-09 and SS-10; respectively). The remaining six compounds were detected at single sample locations. Several pesticide/PCB compounds were detected at sample location SS-02. The off-site background location, SS-12, was found to contain detectable amounts of 4,4-DDT.

Sixteen inorganic elements were detected at sample location throughout the site; analytical values ranged from "Detected" for two elements (mercury and selenium) to greater than 143 times the background detection limit for zinc. Soil collected from sample location SS-09 contained 15 of the 16 inorganic elements detected. It should also be noted that selenium was the only element of the 16 inorganic elements, found at detectable limits, not to be detected at sample location SS-09. Soil collected from sample location SS-02 contained 12 detected inorganic elements and soil collected from sample location SS-10 contained 10 of the 16 inorganic elements detected.

Calcium was detected at 10 sample locations, and concentrations ranged from 3 times the background concentration to 74 times the background concentration at SS-09. Sodium and zinc were detected at nine sample locations; sodium concentrations ranged from "Detected" to 23 times the background detection limit at SS-09, while zinc concentrations ranged from 17 times the background detection limit to 143 times the background detection limit at SS-10. Copper and lead were both found in the same eight sample locations; concentrations varied from 3 times the background to 43 and 45 times the background, respectively. Barium and nickel were both detected in the same five samples (nickel was found in one additional sample location, SS-05); concentrations ranged from detected to 18 times background and 8 times the background detection limit, respectively.

Sediment Sample Analytical Results

Sediment sample SD-02 was collected upstream of the property as Sutton Brook entered the southeastern portion of the property. Sample SD-01 was collected near the junction of the eastern and southern landfill lobes. Sample SD-03 was collected downstream of the landfill (Figure 2). Sample SD-02 was collected as an onsite

background sediment sample.

Three volatile organic compounds were detected from samples collected from sediment sample location SD-01; there were no volatile organic compounds detected in the background sample. Detectable concentrations of toluene, ethylbenzene and xylene were noted in SD-01.

Eleven semi-volatile organic compounds were detected from the two sediment samples, collected from locations SD-01 and SD-03. Samples from the two sample locations contained detectable levels of fluoranthene, pyrene and bis(2-ethylhexyl)phthalate. Samples collected from SD-01 also contained di-n-octyl phthalate at a detectable level. The downstream sample location, SD-03, contained seven other semi-volatile compounds (Table 6). Two pesticide compounds (4,4'-DDE and gamma-chlordane) were detected at location SD-03.

Analytical results indicated the presence of five inorganic elements in the two sediment samples collected (SD-01 and SD-03). A comparison of the analytical results for inorganic elements detected in the background sediment sample (SD-02) with those of SD-01 and SD-03 indicated that lead and zinc were detected in both locations at greater than 6 times the background and 14 times the background detection limit, respectively. Calcium and nickel were also found at detectable levels in SD-01, while copper was detected at 7 times the background concentration.

Leachate Sample Analytical Results

Leachate samples were analyzed from six collection locations (Figure 2) including one blank sample, for limited volatile organic compounds on a photoionization detector gas chromatograph. Nine volatile organic compounds were identified from leachate sample locations LS-01 and LS-03; no volatile organic compounds were detected in the blank sample (Table 6). Several unknown compounds were also detected, including one unknown compound which was identified in all but the blank sample. Detectable concentrations of benzene, chlorobenzene and p-xylene were noted in LS-01, along with detectable concentrations of m-xylene in LS-03. M-xylene was detected at 190 times the background detection limit in LS-01.

SUMMARY

Rocco's Disposal Area located at 1069 South Street, Tewksbury, Massachusetts, is owned by Jeanette Rocco. Access to the property is unrestricted with the exception of the post and rail gate along the South Street access road.

Rocco's Disposal operated as a landfill for approximately 22 years, from 1957 to 1979, before a landfill closure was ordered by the

Town of Tewksbury Board of Health. Unknown quantities of municipal, commercial, and industrial wastes were deposited at the landfill during this time.

Limited information is available pertaining to the type and amount of materials disposed of on the property.

On October 26, 1989, NUS/FIT personnel collected soil, sediment, and leachate samples from Rocco's Disposal Area. Analyses of the 13 soil samples indicated the presence of six volatile organic compounds, 26 semi-volatile, nine pesticide/PCB compounds, and 16 inorganic elements at concentrations ranging from "Detected" to 143 times background concentrations/detection limits. Analyses of the three sediment samples indicated the presence of three volatile organic compounds, 11 semi-volatile, two pesticide/PCB compounds, and 14 inorganic elements at detected concentrations. NUS/FIT screening analyses of the six leachate samples indicated the presence of nine volatile organic compounds at concentrations ranging from "Detected" to 190 times background concentrations/detection limits.

There are 23 public groundwater supply wells within a 4-mile radius of Rocco's Disposal. These sources supply drinking water to an estimated 81,649 people in the four neighboring communities. There are no surface water intakes along the 15-mile downstream pathway from the Rocco's Disposal Area, however there are approximately 74.86 miles of wetland frontage along this pathway.

Based on the analytical results of the soil, sediment and leachate samples collected by NUS/FIT, the potential for direct contact, and the large number use of municipal groundwater wells located with 4 miles of the property, NUS/FIT recommends that continued investigative work be conducted under CERCLA at the Rocco Disposal Area.

Submitted by:


Christine Chisholm
Project Manager

Approval:


Robert Jabach
FIT Office Manager

LIST OF ATTACHMENTS

- ATTACHMENT A:** Soil and Sediment CLP Analytical Results for Rocco's Disposal Area, NUS/FIT October 26, 1989.
- ATTACHMENT B:** Soil and Sediment Sample Detection Limits for Rocco's Disposal Area, NUS/FIT October 26, 1989.
- ATTACHMENT C:** Leachate Sample NUS/FIT Volatile Organic Screening Program Analytical Results and Detection Limits for Rocco's Disposal Area, NUS/FIT October 26, 1989.

DRAFT

Appendix E
Landfill Gas Generation/Emission Calculations

E.1 -- ESTIMATE OF LANDFILL VOLUME

Principal Assumptions:

- 1 Average elevation of the limit of solid waste is approx. 85'
- 2 No waste was placed after 1988
- 3 In-place (compacted) density of solid waste assumed to be 1,000 lbs / bank yd³
 - Range of compacted municipal refuse in landfill is 610 - 1,250 lbs / BCY;
 - (source: Integrated Solid Waste Management, 1993)

Based on these assumptions:

Volume of Refuse = 1,865,933 bank cubic yards (BCY); Refer to calculation in Table E-1
 = 1.43 million cubic meters

Mass of Refuse = 932,967 Short (i.e. U.S.) Tons
 = 0.85 million megagrams

E.2 -- LANDFILL GAS PRODUCTION ESTIMATES

Mass of LFG Generating Refuse -- Rocco's Landfill

Principal Assumptions:

- 1 Daily cover considered inert for LFG generation purposes.
- 2 Volume of daily cover assumed to be 20% of active landfill generating volume.
 - source: Rule-of-Thumb, section 11.1.7, Solid Waste Handbook, 1986.

Based on these assumptions:

Volume of LFG generating Refuse = 1,492,747 bank cubic yards (BCY); Refer to calculation in Table E-1
 Compacted density of = 1,000 lbs / BCY
 Mass of LFG generating Refuse = 746,373 Short (i.e. U.S.) Tons

LFG (i.e. Methane) Generation Rates -- Scholl Canyon Model

Principal Assumptions:

- 1 No waste was placed after 1988.
- 2 Refuse placement was assumed to be equally distributed over time from 1957 - 1988.
- 3 Methane generation will be governed by the Scholl-Canyon Model with the following assumptions:
 - a) No LFG generation will occur 30 years after refuse placement; Scholl Canyon model zeroed out.
 - b) Lag time until methane production occurs (t_{LAG}) = 2 yrs
 - c) Potential Generation Capacity of Refuse (L_o) = 3,000 ft³ CH₄ / ton MSW
 - refer to Table E-3
 - d) Methane production rate (k) = 0.04 yrs⁻¹
 - refer to Table E-3

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E.2 (continued)

Based on these assumptions:

Overall CH_4 Generation Rate = $3.49\text{E}+07 \text{ ft}^3 \text{ CH}_4 / \text{yr}$; Refer to calculations in Table E-2

CH_4 Content of LFG = 50.0% Base Assumption

Overall LFG Generation Rate = $6.97\text{E}+07 \text{ ft}^3 \text{ LFG} / \text{yr}$

Projected Methane Generation Rates

Principal Assumptions:

1. LFG generation rate is controlled by the Scholl-Canyon model with the kinetic coefficients selected.
2. Any MSW greater than 30 years old will have no LFG generation value.

PROJECTED CH_4 GENERATION RATES ROCCO'S LANDFILL

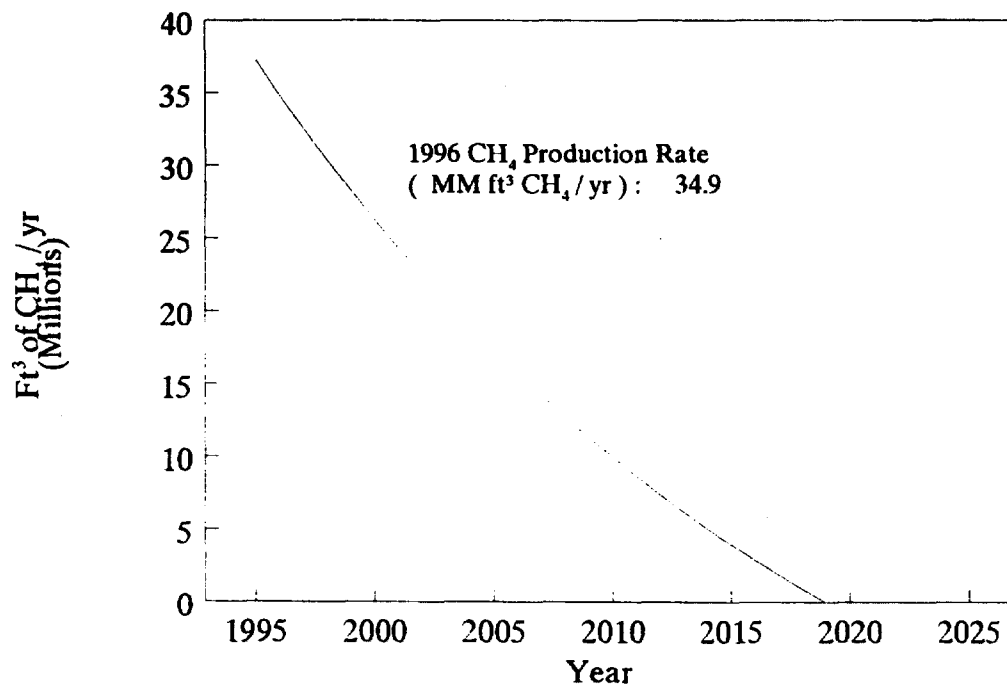


TABLE E-1. ESTIMATED VOLUME OF ACTIVE LFG GENERATING MUNICIPAL SOLID WASTE

ROCCO'S LANDFILL --- TEWKSBURY, MA

Prepared by: R. Adams Date: 6/6/96
 Checked by: S. Czarniecki Date: 6/10/96

Landfill Elevation Contour	Contour Area (ft ²)	Elevation Difference, ΔZ (ft)	Volume of Landfill Estimate (¹) (yd ³)	Comments:
A. Volume of northern portion of landfill				Volume was based on SEA Consultants Inc. Site Engineering Rocco Landfill, Prepared for the Town of Tewksbury, MA, dated May 5, 1996. See Figure A – 1: Base Plan, dated April 1995. (Note: Date of photograph was Dec. 12, 1994.) * – The value represents the area of the limit of solid waste. The average elevation for the limit of solid waste is at approx EL. 85 ft. Therefore, the bottom of the landfill was assumed to be at EL. 85 ft.
El. 172	853	--	--	
El. 170	3,554	2	163	
El. 160	45,104	10	9,011	
El. 150	93,647	10	25,695	
El. 140	214,816	10	57,123	
El. 130	394,346	10	112,808	
El. 120	630,783	10	189,839	
El. 110	825,954	10	269,766	
El. 100	1,006,100	10	339,269	
El. 90	1,263,486	10	420,294	
El. 85	1,369,080 *	5	243,756	
Total = 1,667,723				
B. Volume of southern portion of landfill				
El. 108	9,894	--	--	
El. 106	46,447	2	2,087	
El. 104	85,642	2	4,892	
El. 102	137,590	2	8,268	
El. 100	186,610	2	12,007	
El. 90	344,743	10	98,399	
El. 85	438,878 *	5	72,558	
Total = 198,210				
Volume of landfill (BCY) : 1,865,933				– Volume calculated by = A + B – Assumed – Active LFG generation waste (no cover mat'ls) – Based on area of limit of solid waste (SEA, 1995)
Municipal refuse portion estimated @ (²) 80.0%				
Volume of active LFG generating waste (BCY) 1,492,747				
Approximate size of landfill (acres) : 42				

Notes: (1) Volume estimated using "Area End Method": for example
 volume (El "x" to "y") = $\left[\frac{1}{2} \cdot (A_{El \cdot x} + A_{El \cdot y}) \right] \cdot \Delta Z \cdot (1 \text{ yd}^3 / 27 \text{ ft}^3)$

(2) Rule-of-Thumb estimate, section 11.1.7, Solid Waste Handbook, 1986.

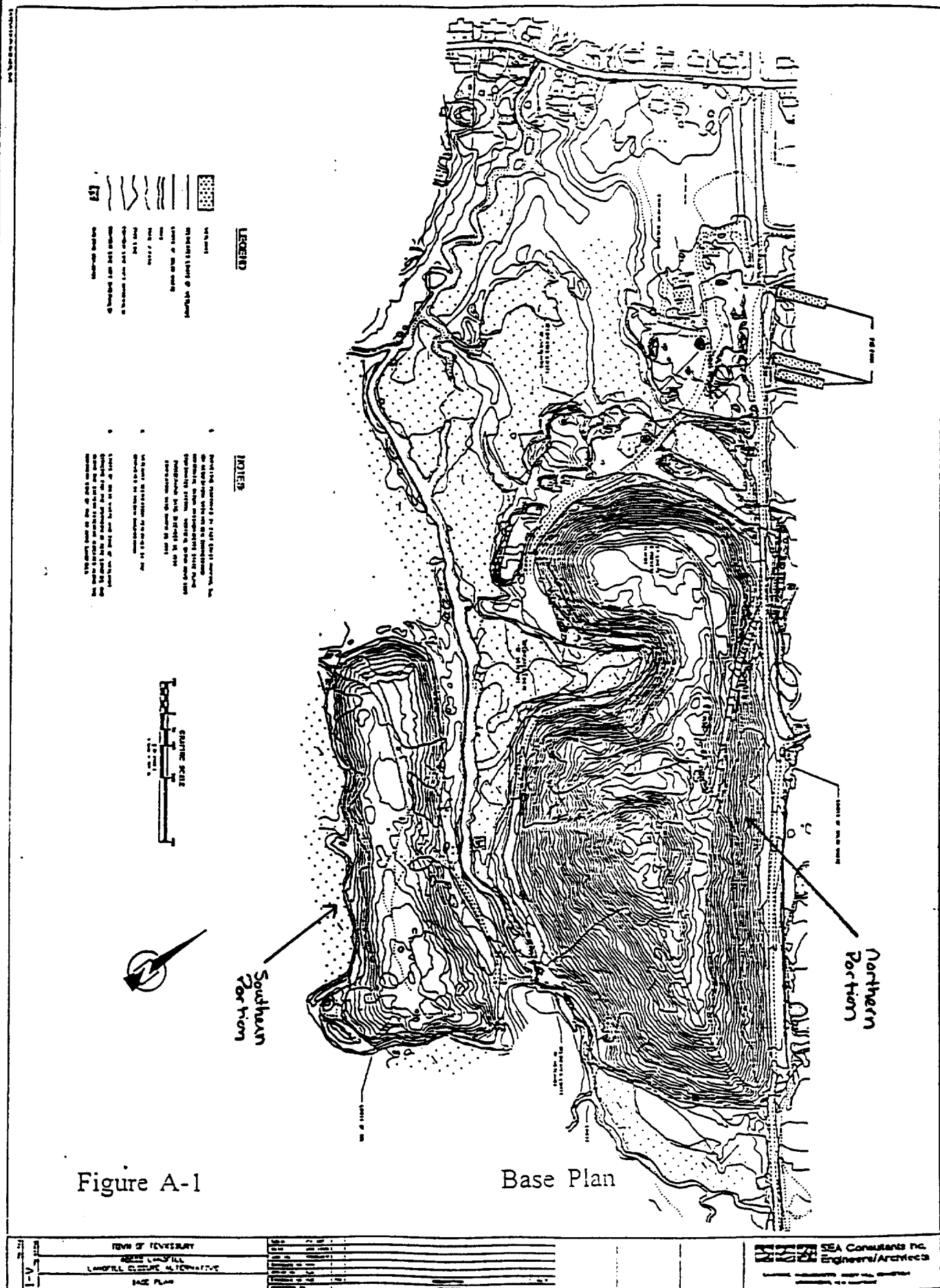


TABLE E-2. GAS GENERATION RATE CALCULATION -- SCHOLL CANYON MODEL

ROCCO'S LANDFILL -- TEWKSBURY, MA

Prepared by: R. Adams Date: 6/6/96

Checked by: S. Czarniecki Date: 6/10/96

FORMULA: $Q = k \cdot L_0 \cdot R [\exp \{ -k \cdot (t - t_{LAG}) \}]$ **WHERE:** Q = landfill gas generation rate @ time t (ft³ of CH₄ / yr)L₀ = potential methane gas generation capacity of refuse (ft³ of CH₄ / ton MSW)

R = annual refuse acceptance rate in landfill (tons MSW)

k = methane production rate (1 / yr)

t = time since refuse placement (yr)

t_{LAG} = time to reach conditions suitable for methane production (yr)

Municipal Solid Waste in Landfill (BCY) from Table A-1 :

1,492,747

In-place density of MSW (lbs / BCY):

1,000

Municipal Solid Waste in Landfill (tons):

746,373

R, annual refuse acceptance rate (tons MSW / yr) 1957-1988¹:

24,077

Refuse acceptance rate per day (260 days/yr):

93

INPUT PARAMETERS:

L = 3,000

Year closed to MSW =

1988

k = 0.04

Current year =

1996

lag = 2

Time since closure =

8

YEAR	TIME SINCE REFUSE PLACEMENT	Q, CH ₄ GENERATION RATE (ft ³ / yr) 1996
1957	39	0.00E+00
1958	38	0.00E+00
1959	37	0.00E+00
1960	36	0.00E+00
1961	35	0.00E+00
1962	34	0.00E+00
1963	33	0.00E+00
1964	32	0.00E+00
1965	31	0.00E+00
1966	30	9.43E+05
1967	29	9.81E+05
1968	28	1.02E+06
1969	27	1.06E+06
1970	26	1.11E+06
1971	25	1.15E+06
1972	24	1.20E+06
1973	23	1.25E+06
1974	22	1.30E+06
1975	21	1.35E+06
1976	20	1.41E+06
1977	19	1.46E+06
1978	18	1.52E+06
1979	17	1.59E+06
1980	16	1.65E+06
1981	15	1.72E+06
1982	14	1.79E+06
1983	13	1.86E+06
1984	12	1.94E+06
1985	11	2.02E+06
1986	10	2.10E+06
1987	9	2.18E+06
1988	8	2.27E+06

**TOTAL ANNUAL CURRENT PRODUCTION
OF METHANE FROM LFG, 1996****3.49E+07** ft³ of CH₄ / yr**NOTE:**

1 - Although the landfill operated as a MSW landfill from 1957 to 1979, refuse was still brought to the site through the late 1980's. It has been assumed that no refuse was deposited after 1988.

TABLE E-3. ESTIMATION OF SCHOLL-CANYON PARAMETERS

Rocco's Landfill -- Tewksbury, MA

Prepared by: D. Peters 5/22/96

Checked by: R. Adams 6/06/96

Methane Gas Generation Capacity of Refuse (L_0)

Source or Reference	L_0 Values ⁽¹⁾		Comments:
	Dry Basis (ft ³ CH ₄ / dry ton MSW)	Wet Basis ⁽²⁾ (ft ³ CH ₄ / in- place ton MSW)	
a) Barlaz, et al, 1989	1,121	841 ⁽²⁾	
b) Marticorena, et al, 1993	2,083	1,562 ⁽²⁾	
c) Kinman, et al, 1987	3,204	2,403 ⁽²⁾	
d) Marique, et al, 1989	3,845	2,884 ⁽²⁾	
e) Tasbasaran, 1982 ; Barlaz, et al, 1989 ; Findikakis, et al, 1988	4,806 6,408	3,605 ⁽²⁾ 4,806	Theoretical estimate -- lower range Theoretical estimate -- upper range
f) EMCON, 1980	-- --	1,999 4,005 5,991	Lower range Middle range Upper range
g) Federal Register, 3/12/96	---	5,444	Default value for U.S. EPA NMOCs model
Average value:		3,354	
Std Deviation:		1,625	
Assumed Value, L_0		3,000	

Notes:

(1) Units of L_0 are cubic feet of methane gas per U.S. (i.e. short) ton of refuse; dry basis is without water and wet basis is to be considered "in-place".

(2) Dry weight and wet weight basis converted as follows (source: Integrated Solid Waste Management, p. 72, 1993)

$$W_{\text{DRY}} / W_{\text{WET}} = [1 - (M / 100\%)] \text{ where } M = \text{moisture content (\% by weight)}$$

$$M = \underline{\hspace{1cm}} 25\% \text{ assumed moisture content value for Rocco refuse (typical value)}$$

Methane Production Rate Constant (k)

Source or Reference	k Values (1 / years)	Comments:
a) Wall and Zeiss, 1995	0.0312 0.0478	Lower range; correlated to long-term landfill consolidation Upper range; correlated to long-term landfill consolidation
b) Federal Register, 3/12/96	0.05	Default value for U.S. EPA NMOCs model
Average value:	0.043	
Assumed Value, k	0.04	Intermediate value utilized for model projections.

E.3 -- LANDFILL GAS NMOC EMISSIONS ESTIMATES

Purpose:

EPA's "Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills", found in the Federal Register dated March 12, 1996, requires that owners/operators of landfills with a design capacity >2.5 MM Mg or MM m³ calculate their non-methane organic compounds (NMOC) emission rate.

Section 60.754(a)(1)(ii) of the NSPS/EG requires that the following equation be used if the actual year-to-year solid waste acceptance rate is unknown:

$$M_{NMOC} = 2L_o R(e^{-kt} - e^{-kc})(C_{NMOC})(3.6 \times 10^{-9})$$

where:

- M_{NMOC} = mass emission rate of NMOC (Mg / yr)
- L_o = methane generation potential (m³ / Mg)
- R = average annual acceptance rate (Mg / yr)
- k = methane generation rate constant (1 / yr)
- t = age of the landfill (yr)
- C_{NMOC} = concentration of NMOC (ppmv)
- c = time since closure (yr)
- 3.6×10^{-9} = conversion factor

It further requires that the following "Tier 1" default values be used in the equation:

L_o = 170 m³ / Mg
 k = 0.05 1 / yr
 C_{NMOC} = 4,000 ppmv

From Table E-2:

R = 24,077 tons/yr
 = 21,888 Mg/yr (Note: 1 Mg = 1.1 tons)
 t = 39 yr
 c = 8 yr

$$M_{NMOC} = 2L_o R(e^{-kt} - e^{-kc})(C_{NMOC})(3.6 \times 10^{-9})$$

$$M_{NMOC} = \boxed{57 \text{ Mg / yr}}$$

Notes regarding the above analysis:

The NSPS/EG states that the Tier 1 default values of k , L_o , and C_{NMOC} tend to overstate NMOC emission rates for most landfills, and are intended to indicate the need to install a collection and control system or perform a more detailed Tier 2 analysis. The NSPS/EG further recommends that these default values not be used for estimating landfill gas emissions.

Due to the fact that the M_{NMOC} estimate using the Tier 1 default values is just over the regulatory limit of 50 Mg/yr a more detailed Tier 2 or 3 analysis appears warranted.

A Tier 2 analysis would involve the collection and analysis of LFG samples to determine the site specific NMOC concentration (C_{NMOC}). Once the site specific C_{NMOC} is determined, the M_{NMOC} is recalculated. If the M_{NMOC} is still greater than 50 Mg/yr a Tier 3 analysis can be conducted, or a collection and control system must be implemented.

A Tier 3 analysis involves the determination of a site specific methane generation rate constant (k). Once determined, the M_{NMOC} is recalculated using the new k and C_{NMOC} .

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E.3 (continued)

NMOC EMISSIONS ESTIMATE USING OTHER DEFAULT VALUES:

Purpose:

As described above, the EPA Tier 1 default values may over estimate NMOC emissions. This analysis uses more typical values, in M&E's opinion, than the EPA Tier 1 default values of L_o , k , and C_{NMOC} in order to determine if a more detailed Teir 2 or 3 analysis of NMOC emissions is warranted.

NMOC Estimate Using Different Values for L_o and k .

where: L_o = methane generation potential (m^3 / Mg)
 k = methane generation rate constant ($1 / yr$)

	EPA Default	M&E Assumptions ¹ Used w/ Scholl Canyon model
L_o (m^3 / Mg) =	170	93 ²
k ($1 / yr$) =	0.05	0.04

Note:

1 See Table E-3 for estimation of Scholl-Canyon parameters

$$2 \text{ (m}^3/\text{Mg)} = \text{(ft}^3/\text{ton)} \times \frac{1.1 \text{ tons}}{1 \text{ Mg}} \times \frac{1 \text{ m}^3}{35.31 \text{ ft}^3}$$

(From Page E.1 -- L_o = 3,000 ft^3 / ton)

Assuming:

L_o (m^3 / Mg) = 170 (EPA Default)
 k ($1 / yr$) = 0.04 (M&E Default)

$$M_{NMOC} = \boxed{55 \text{ Mg/yr}}$$

Assuming:

L_o (m^3 / Mg) = 93 (M&E Default)
 k ($1 / yr$) = 0.04 (M&E Default)

$$M_{NMOC} = \boxed{30 \text{ Mg/yr}}$$

Notes regarding the above analysis:

- 1 Using a more typical value for k does not substantially change the NMOC emission rate.
- 2 Using a more typical value for L_o does substantially change the NMOC emission rate. However, the NSPS/EG does not allow for the determination of a site specific L_o .

NMOC Estimate Using a Different Value for C_{NMOC}

Principal Assumptions:

- 1 Soil gas samples collected in June 1995 are a good indication of LFG characteristics.
- 2 Soil gas samples were analyzed using the TO-14 method, which analyzes VOC's. VOC's typically comprise 28% of NMOC emissions (EPA Draft AP-42, 1995).

E.3 (continued)

Average Concentration Detected Soil Gas Survey Rocco's Landfill, Tewksbury MA June 1995

Volatile Organic Compound ¹	Molecular Weight	Average Conc. ² (ppbv)	Average Emission Conc. ³ (Mg/ft ³)	Average Emission Rate ⁴ (Mg/yr)
Methylene Chloride	84.93	1,279	1E-10	8.77E-03
Trichlorofluoromethane	137.38	65,970	1E-08	7.32E-01
1,1-Dichloroethane	98.96	125	1E-11	1.00E-03
Dichlorodifluoromethane	120.91	54,847	8E-09	5.36E-01
Trichloroethene	131.39	277	4E-11	2.94E-03
Tetrachloroethene	165.83	287	6E-11	3.85E-03
Toluene	92.1	12,040	1E-09	8.96E-02
Chlorobenzene	112.56	277	4E-11	2.51E-03
Ethylbenzene	106.17	6,605	8E-10	5.66E-02
m,p-Xylene	106.2	13,695	2E-09	1.17E-01
o-Xylene	106.2	3,015	4E-10	2.59E-02
Total Xylene	106.2	16,355	2E-09	1.40E-01
1,1,2-Trichloro-1,2,2-trifluoroethane	187.38	58	1E-11	8.72E-04
cis-1,2-Dichloroethene	96.94	353	4E-11	2.76E-03
1,3,5-Trimethylbenzene	120.2	1,708	2E-10	1.66E-02
1,2,4-Trimethylbenzene	120.2	2,263	3E-10	2.20E-02
1,3-Dichlorobenzene	147.00	155	3E-11	1.84E-03
1,4-Dichlorobenzene	147.00	172	3E-11	2.04E-03
1,2,4-Trichlorobenzene	181.45	55	1E-11	8.00E-04
Acetone	72.1	1,131	9E-11	6.59E-03
TOTAL:		180,664	2.54E-08	1.77E+00

NOTE:

- The VOCs listed are only those VOCs which were detected above the TO-14 detection limit.
- Average concentration detected at the four soil gas sampling locations. (See Table 1.7-7 of the ISA Report). At locations where VOCs were non-detect, 1/2 the detection limit was used for averaging.

$$3 \text{ Conc. (mg/m}^3\text{)} = \frac{\text{Conc. (ppmv)} \times \text{MW}}{24.45}$$

$$\text{Conc. (Mg/ft}^3\text{)} = \text{Conc. (mg/m}^3\text{)} \times \frac{1 \text{ g}}{1000 \text{ mg}} \times \frac{1 \text{ Mg}}{1,000,000 \text{ g}} \times \frac{1 \text{ m}^3}{35.31 \text{ ft}^3}$$

$$4 \text{ Emission Rate (Mg/yr)} = \text{Conc. (Mg/ft}^3\text{)} \times \text{LFG Generation Rate (ft}^3\text{/yr)}$$

$$\text{Where: LFG Generation Rate} = 6.97\text{E}+07 \text{ ft}^3 \text{ LFG / yr} \quad (\text{See estimate on Page E.1})$$

Assuming:

$$\begin{aligned}
 L_o \text{ (m}^3 \text{ / Mg)} &= 170 && (\text{EPA Default}) \\
 k \text{ (1 / yr)} &= 0.05 && (\text{M\&E Default}) \\
 C_{\text{NMOC}} \text{ (ppmv)} &= C_{\text{VOC}} \times 1/0.28 = 645 && (\text{See Table above}) \\
 M_{\text{NMOC}} &= \boxed{9 \text{ Mg / yr}}
 \end{aligned}$$

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E.3 (continued)

Notes regarding the above analysis:

- 1 The 1995 site specific data, results indicate that the actual C_{NMOC} may be much less than the EPA default value of 4000 ppmv and therefore, the NMOC emission rate may be significantly below the regulatory threshold of 50 Mg/yr.
- 2 The TO-14 data does not fully satisfy Tier 2 characterization program requirements, because collection was performed prior to the promulgation of the EPA NSPS/EG for purposes other than Tier 2 characterization.
- 3 Therefore, a more detailed Tier 2 analysis should be conducted to confirm that NMOC emissions do not exceed the regulatory limit.
- 4 If the actual C_{NMOC} is determined to be less than 3500 ppmv then the M_{NMOC} will not exceed 50 Mg/yr, and thus, a collection and control system will not be required.

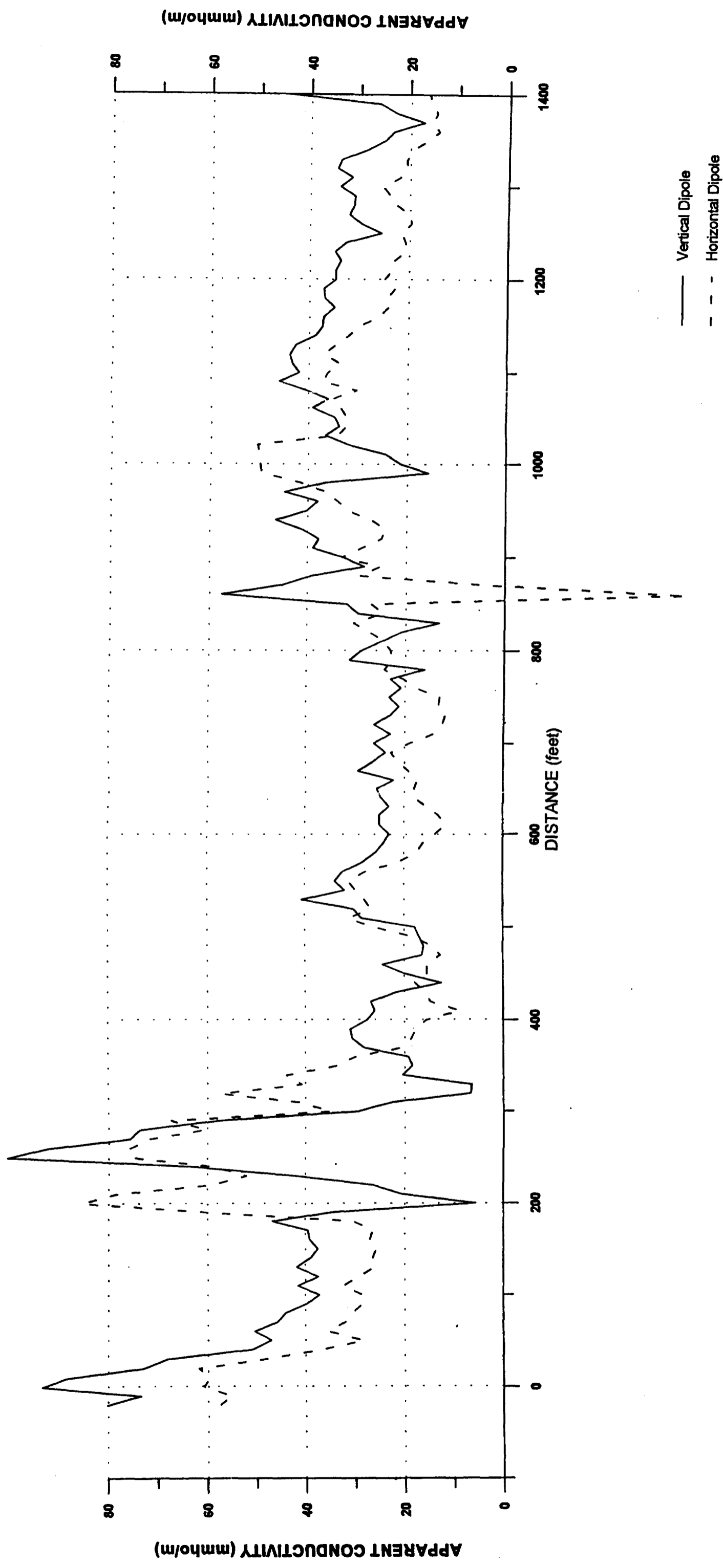
COMPARISON OF NMOC ESTIMATES

CASE	L_o (m ³ /Mg)	k (1/yr)	C_{NMOC} (ppmv)	M_{NMOC} (Mg/yr)
1 EPA L_o , k and C_{NMOC}	170	0.05	4000	57
2 EPA L_o and k with C_{NMOC} per 1995 TO-14 results at assumed VOC ratio to NMOCs	170	0.05	645	9
3 Typical L_o and k with EPA default C_{NMOC}	93	0.04	4000	30

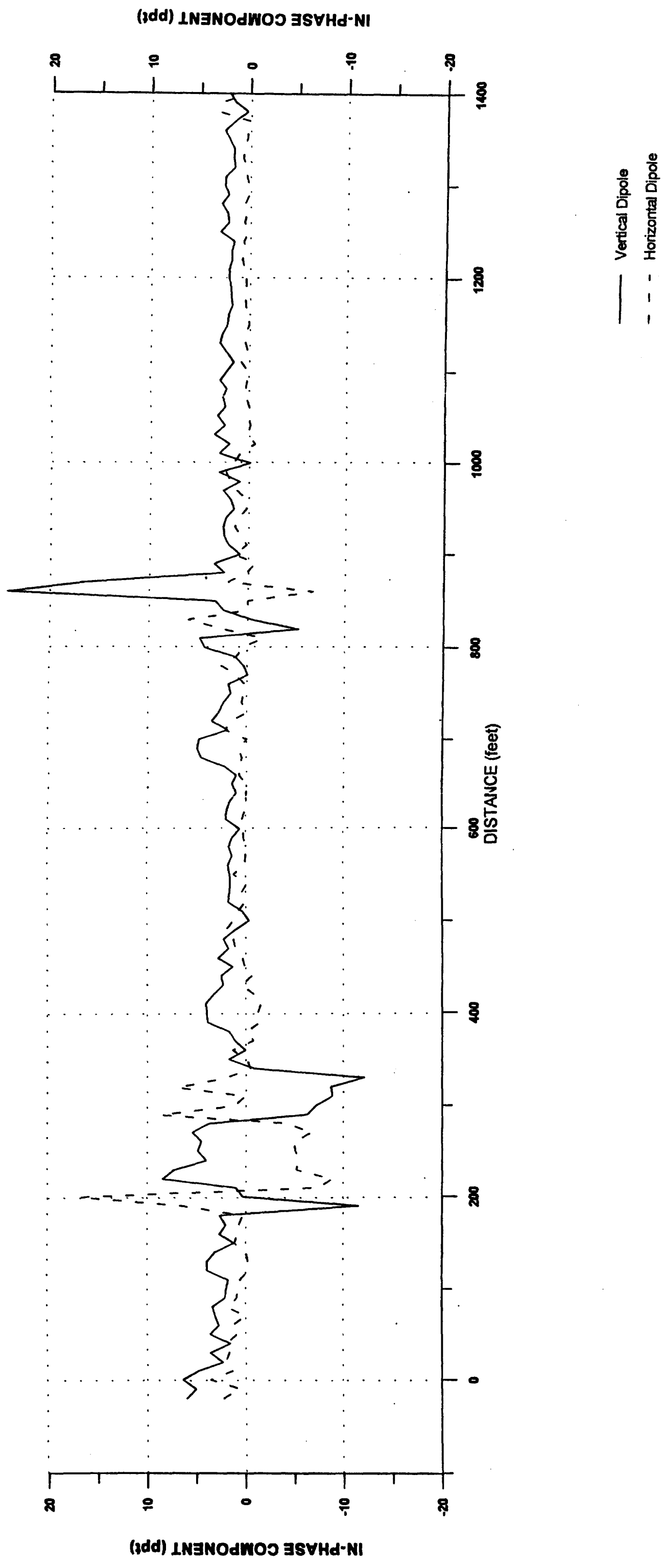
Appendix F
EM-Survey Profiles

LINE A1

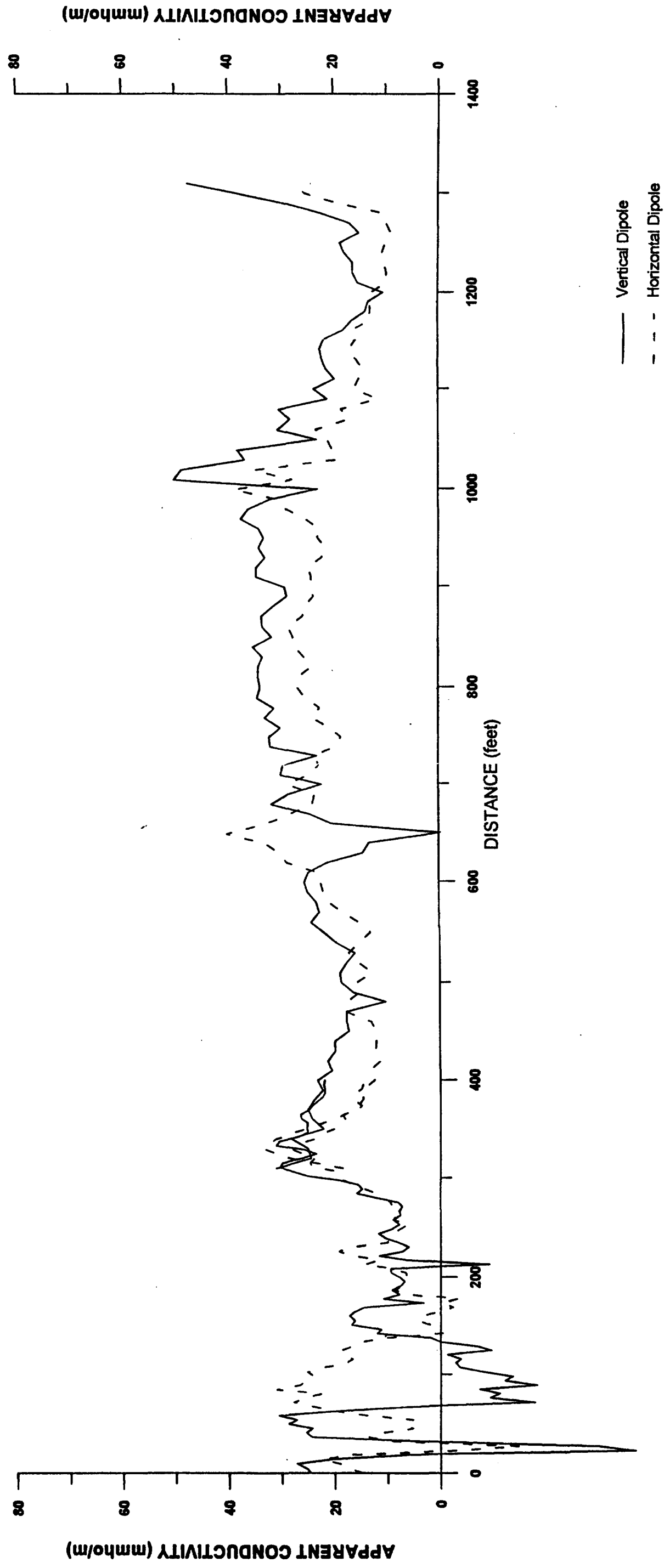
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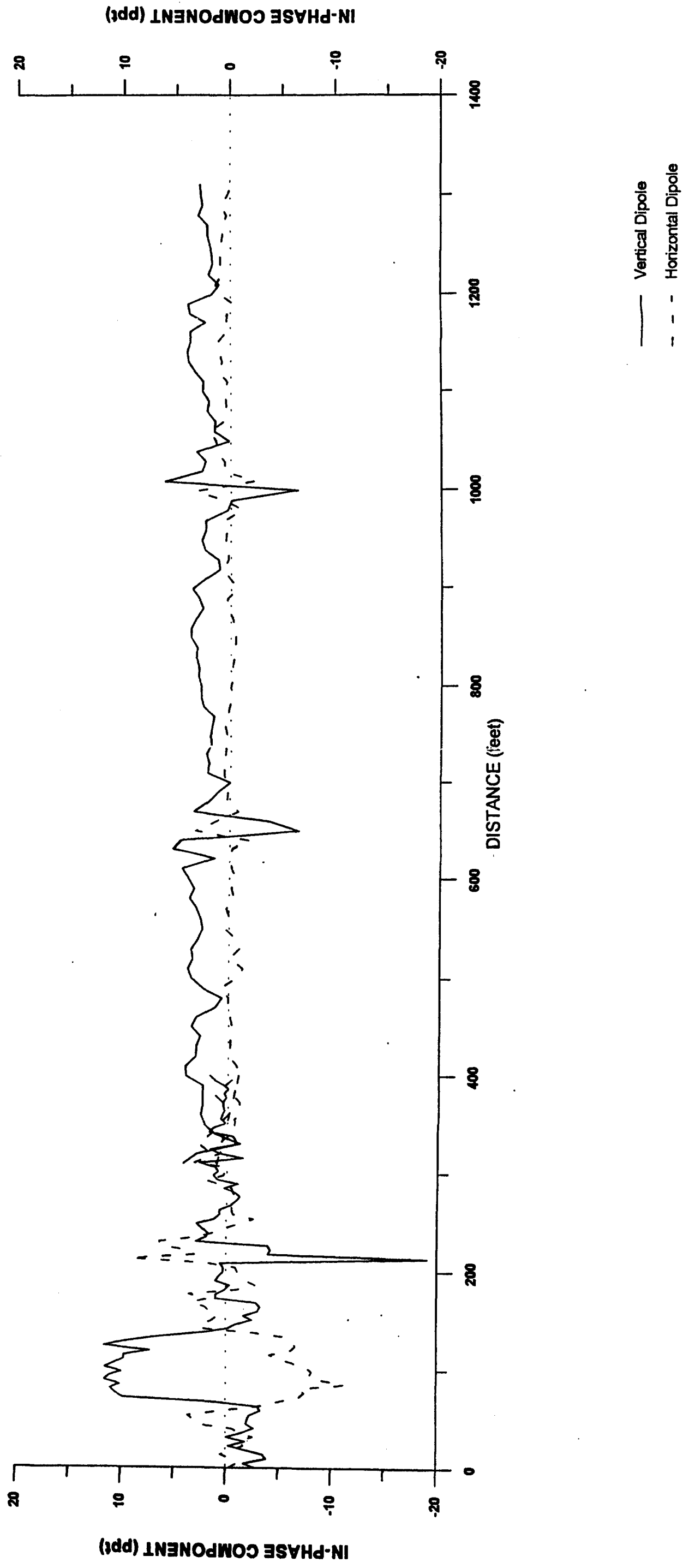
LINE A1



LINE A2

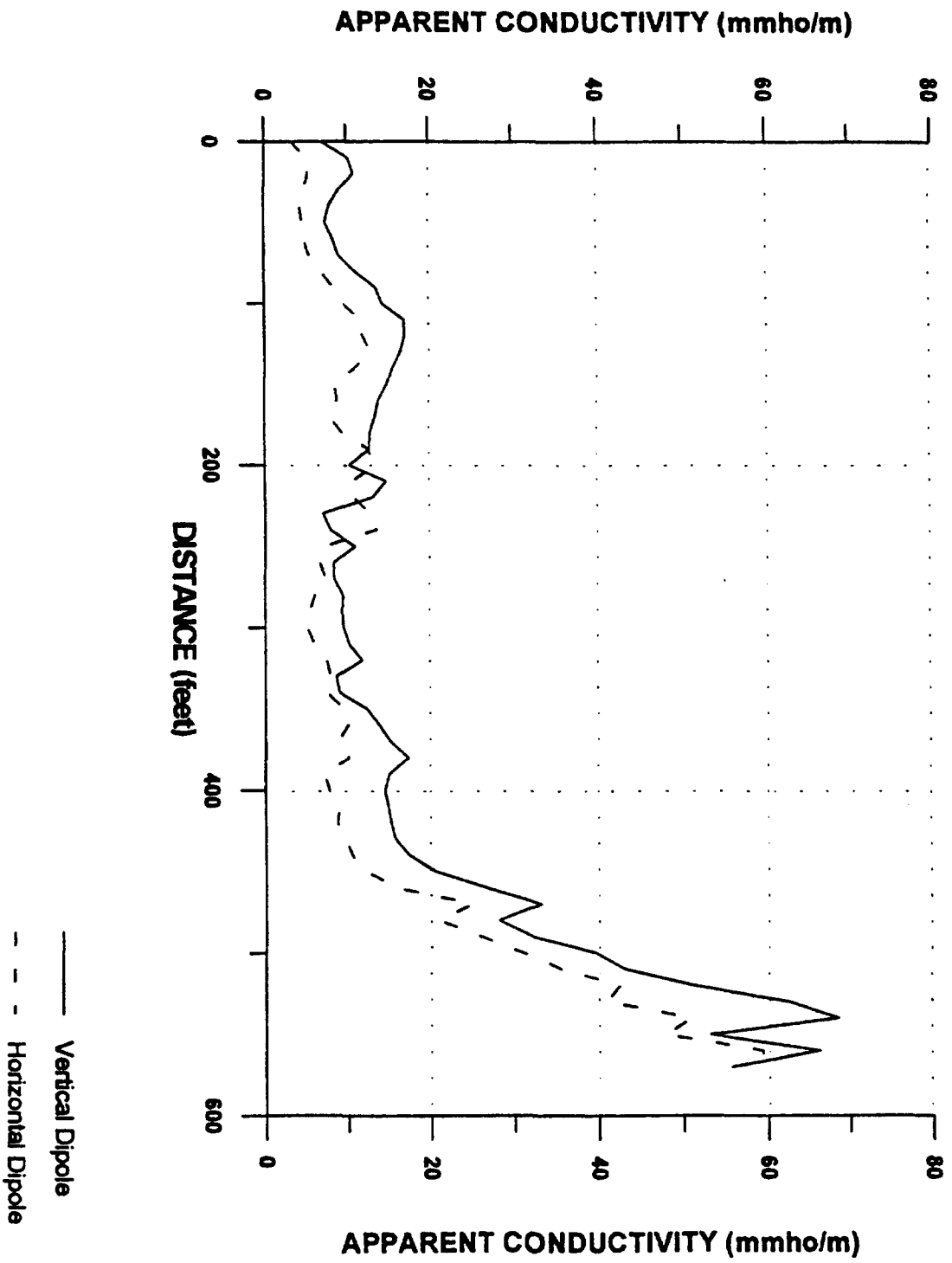


LINE A2

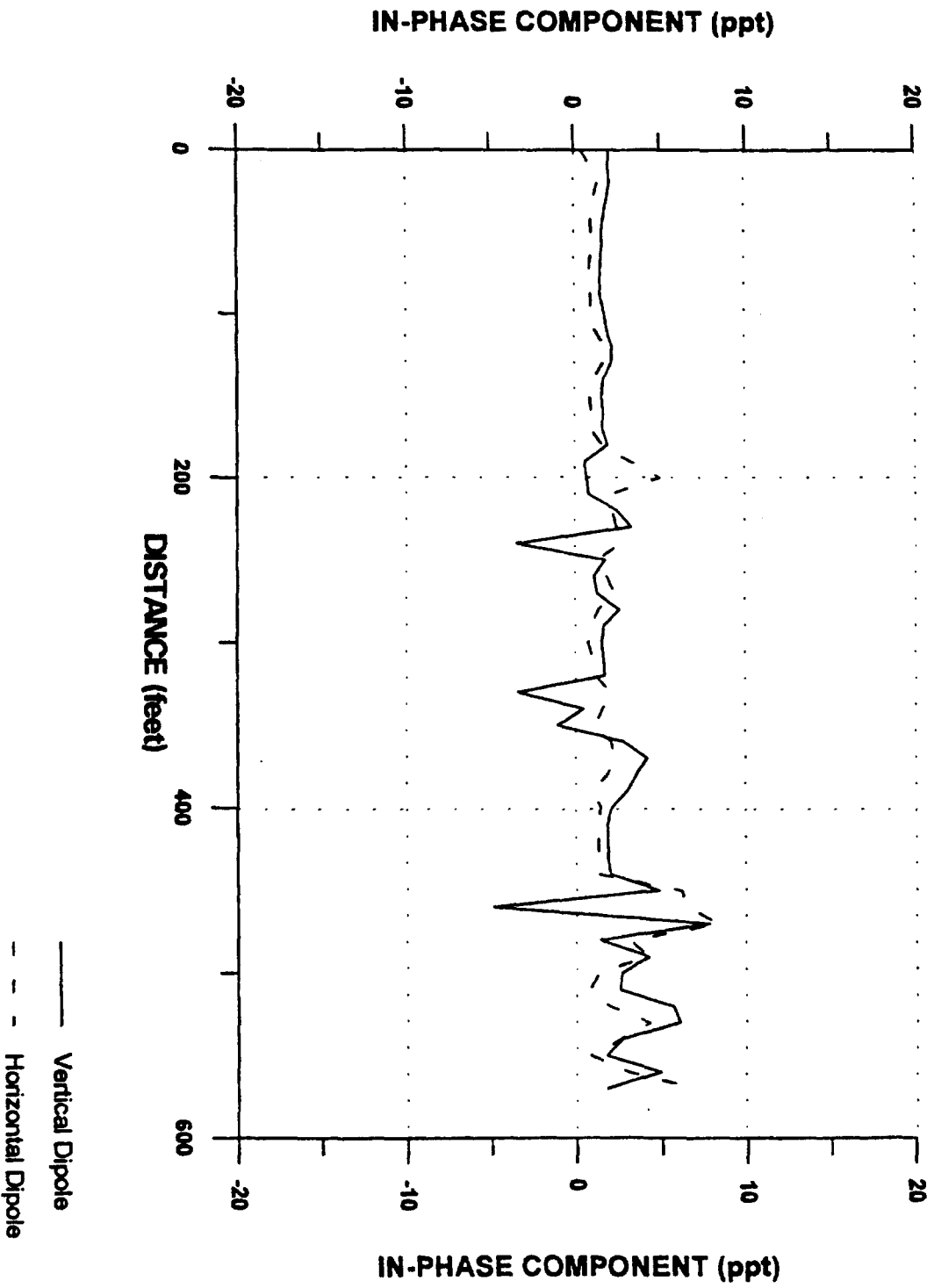


LINE B1

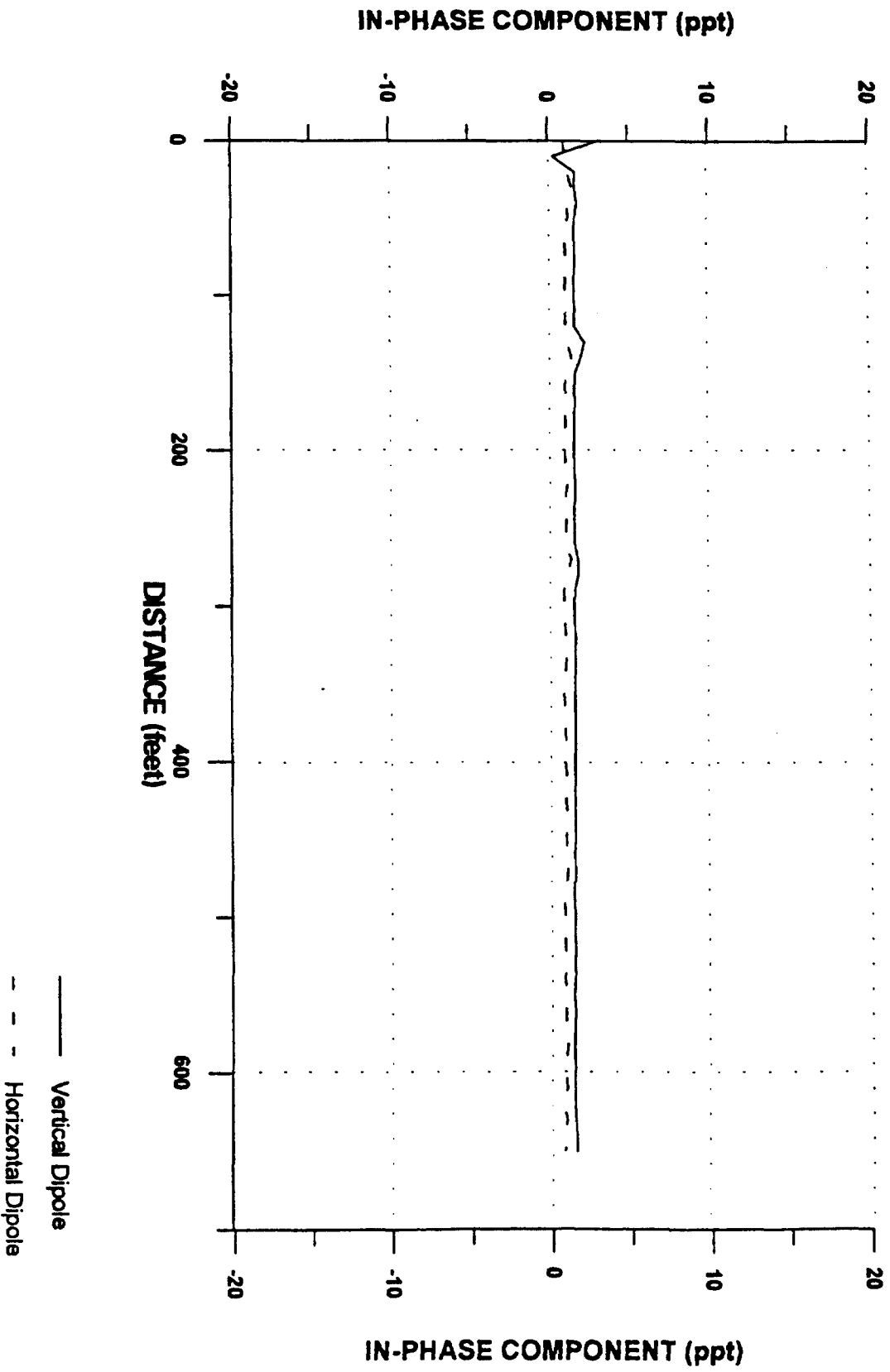
HAGER-RICHTER
GEOSCIENCE, INC.



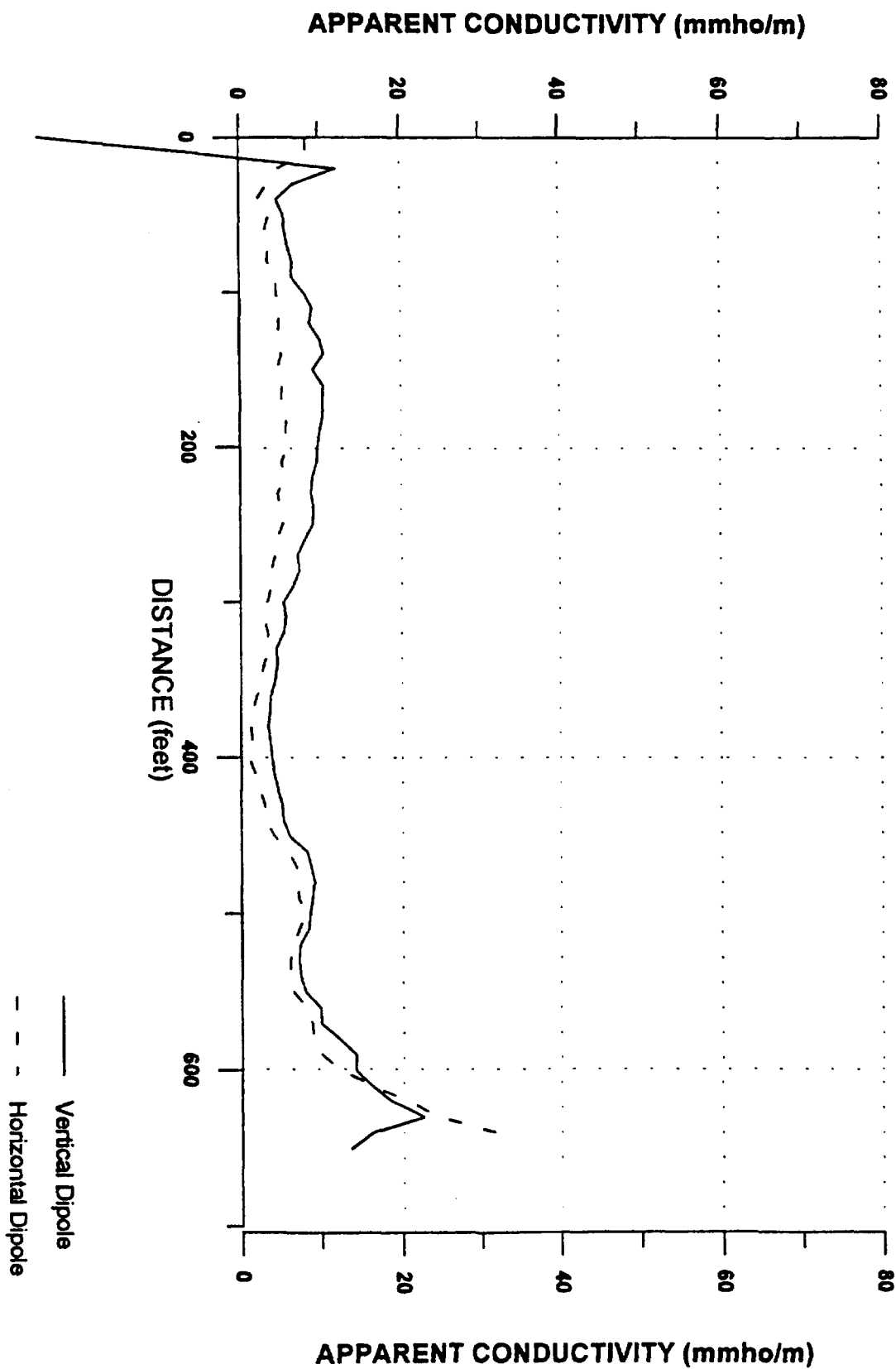
LINE B1



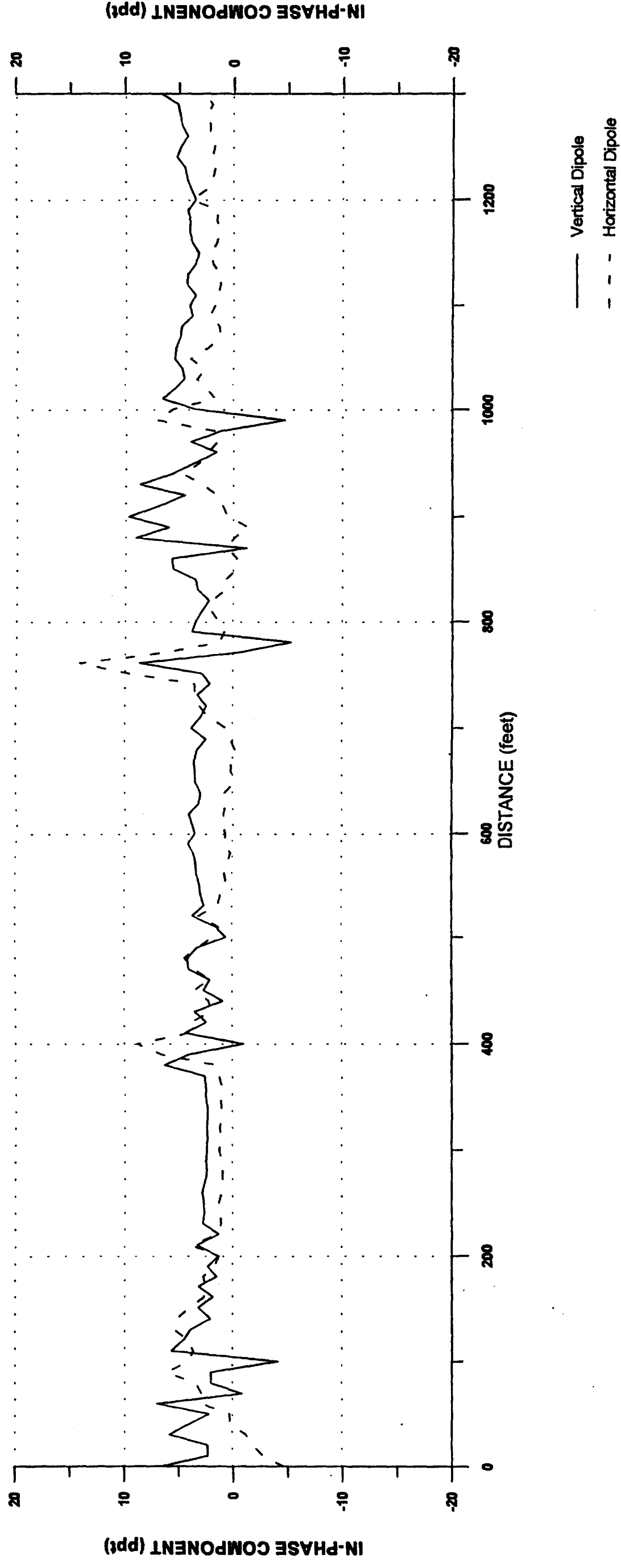
LINE B2



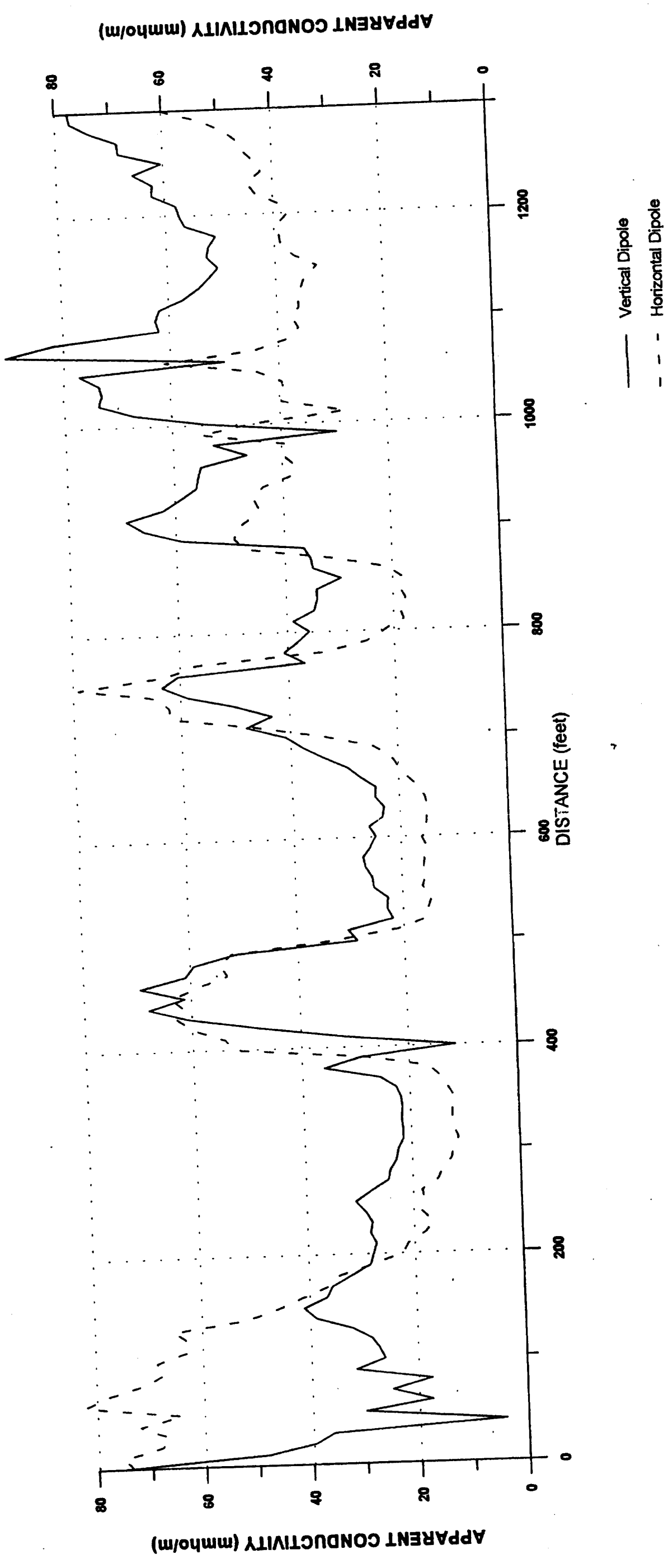
LINE B2



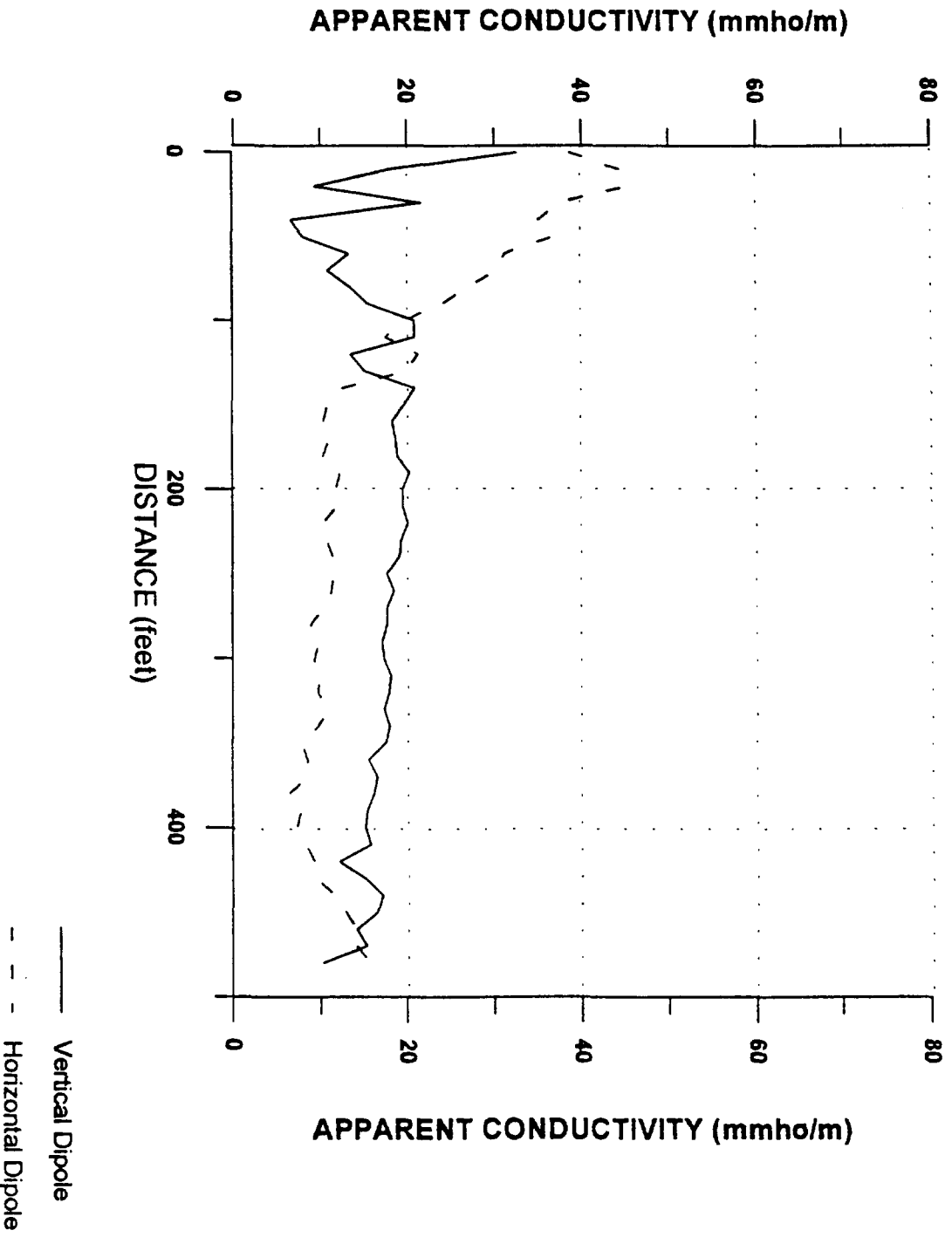
LINE C1



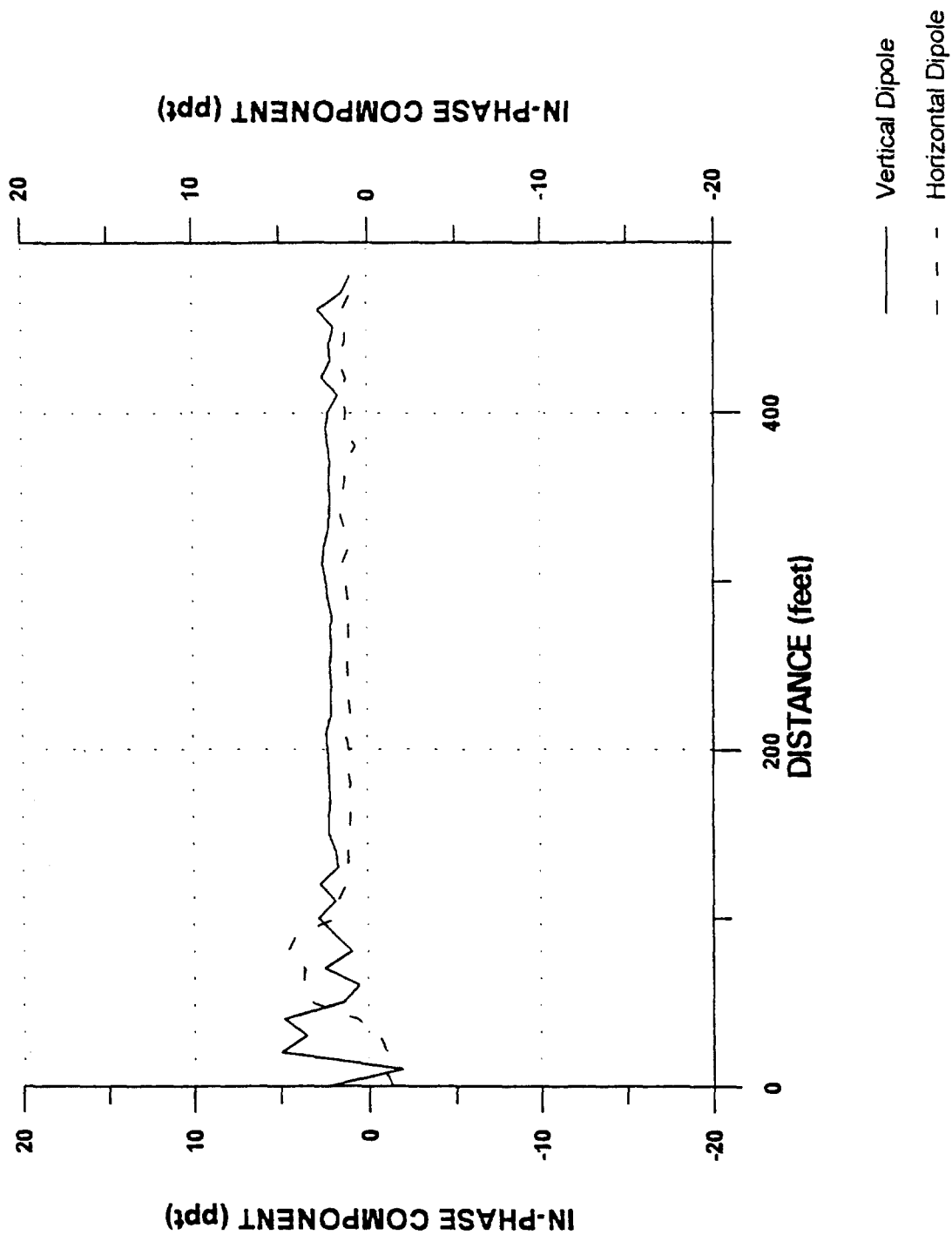
LINE C1



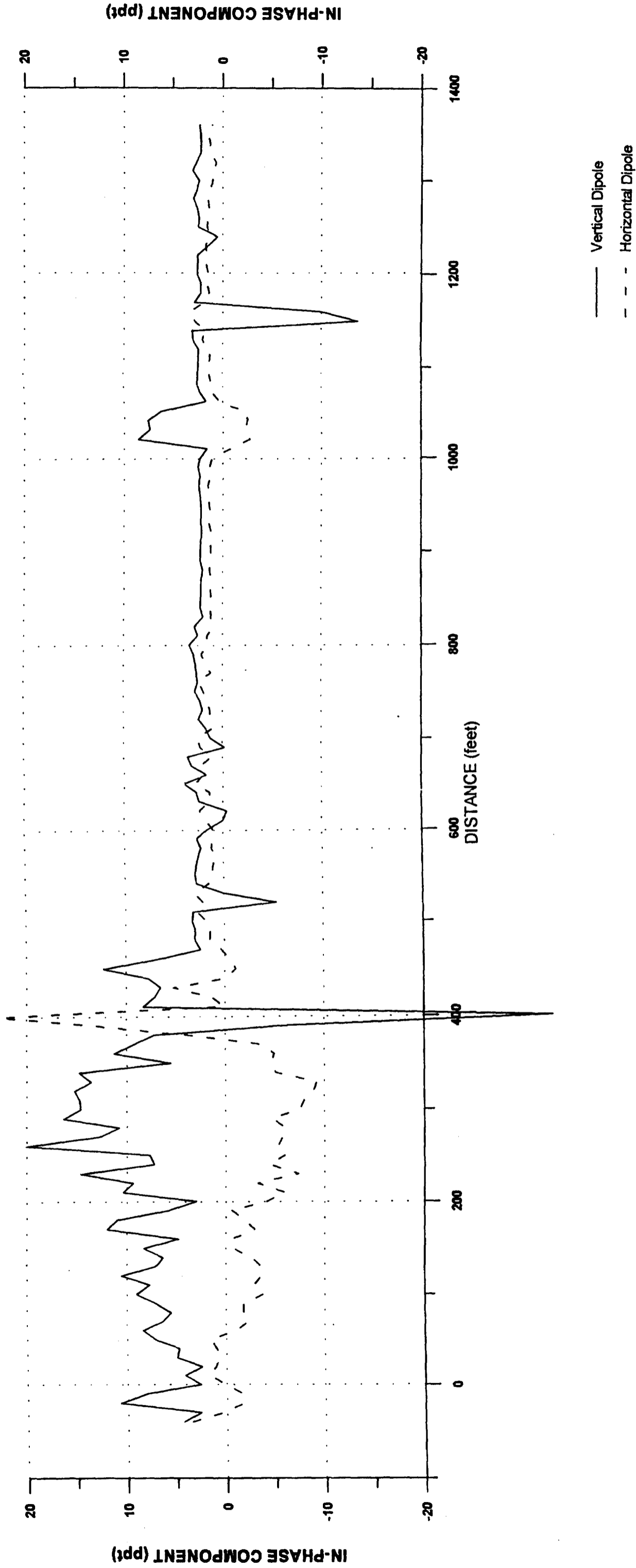
LINE C2



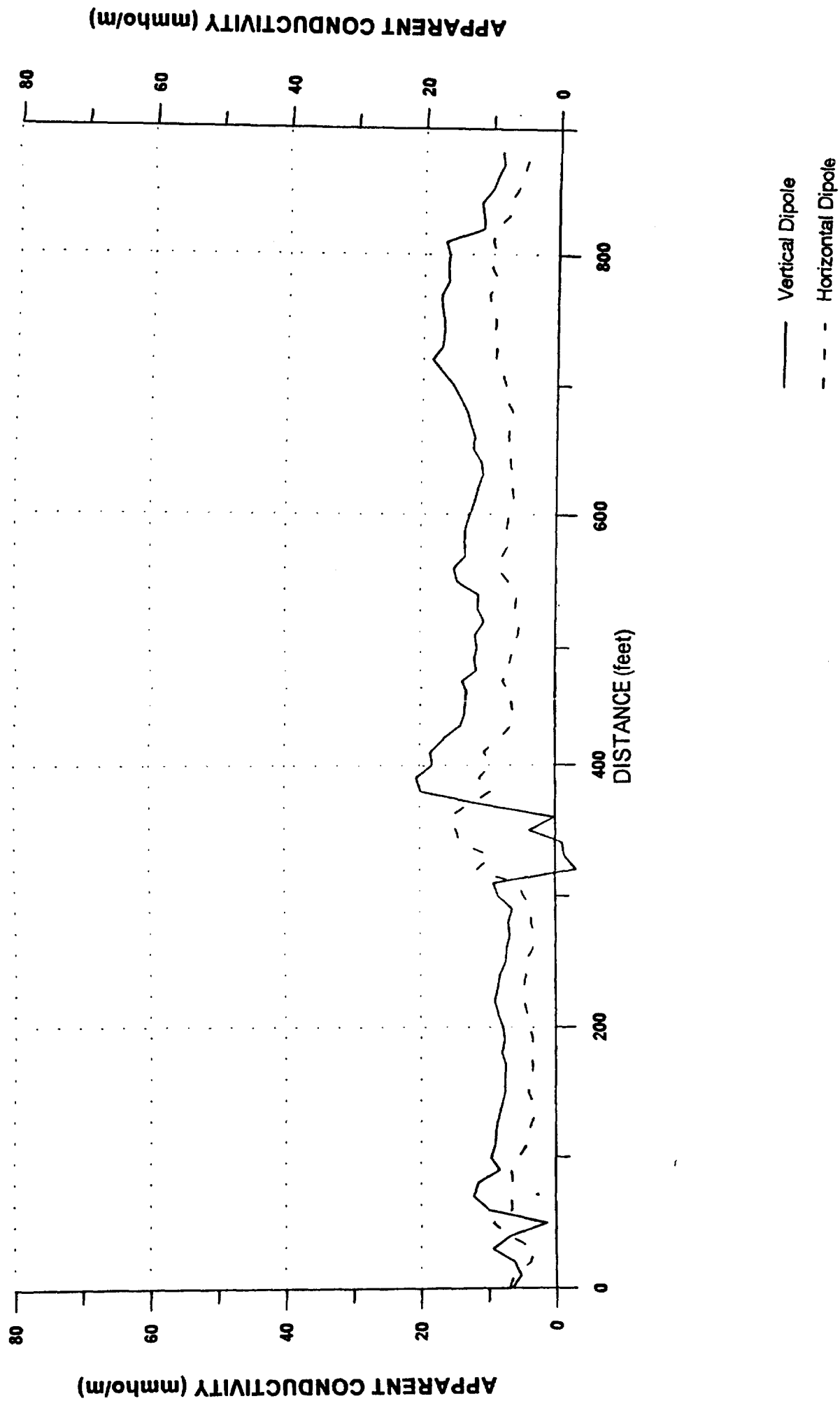
LINE C2



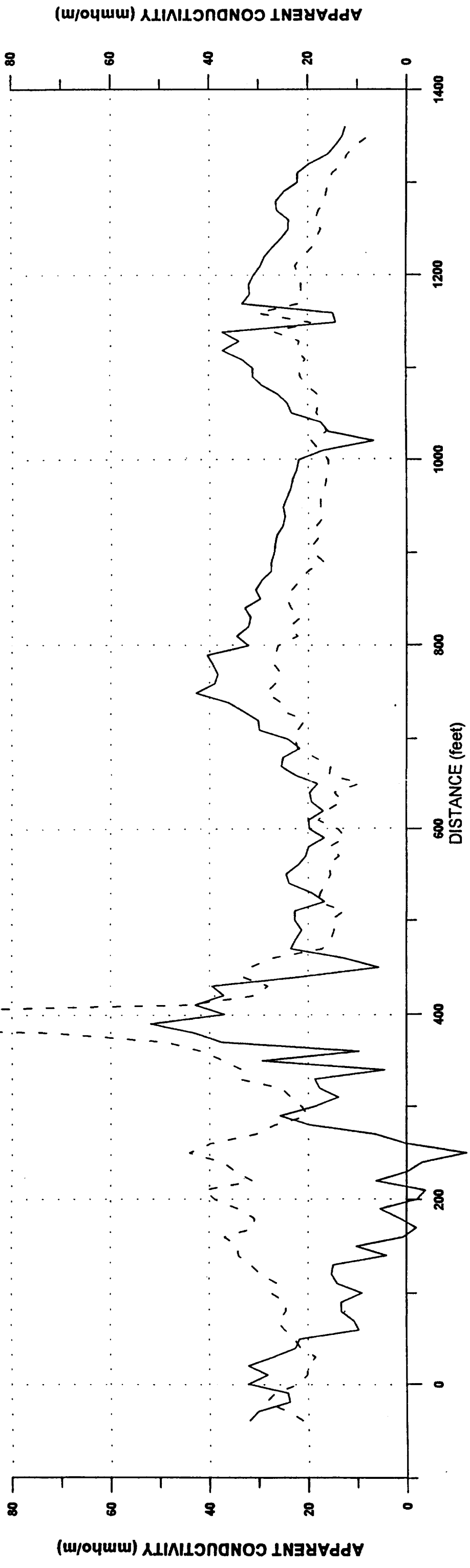
LINE D1



LINE D2

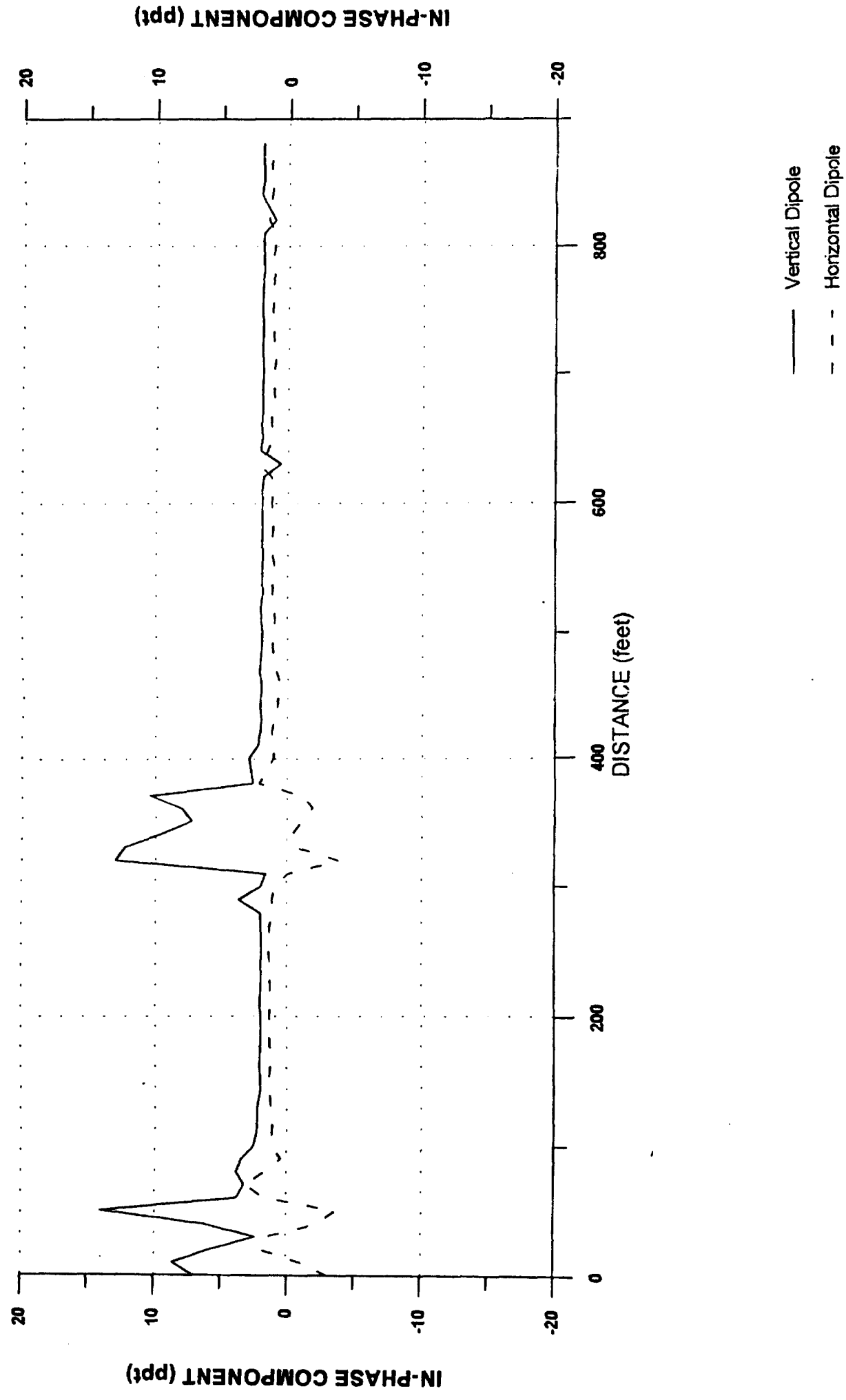


LINE D1



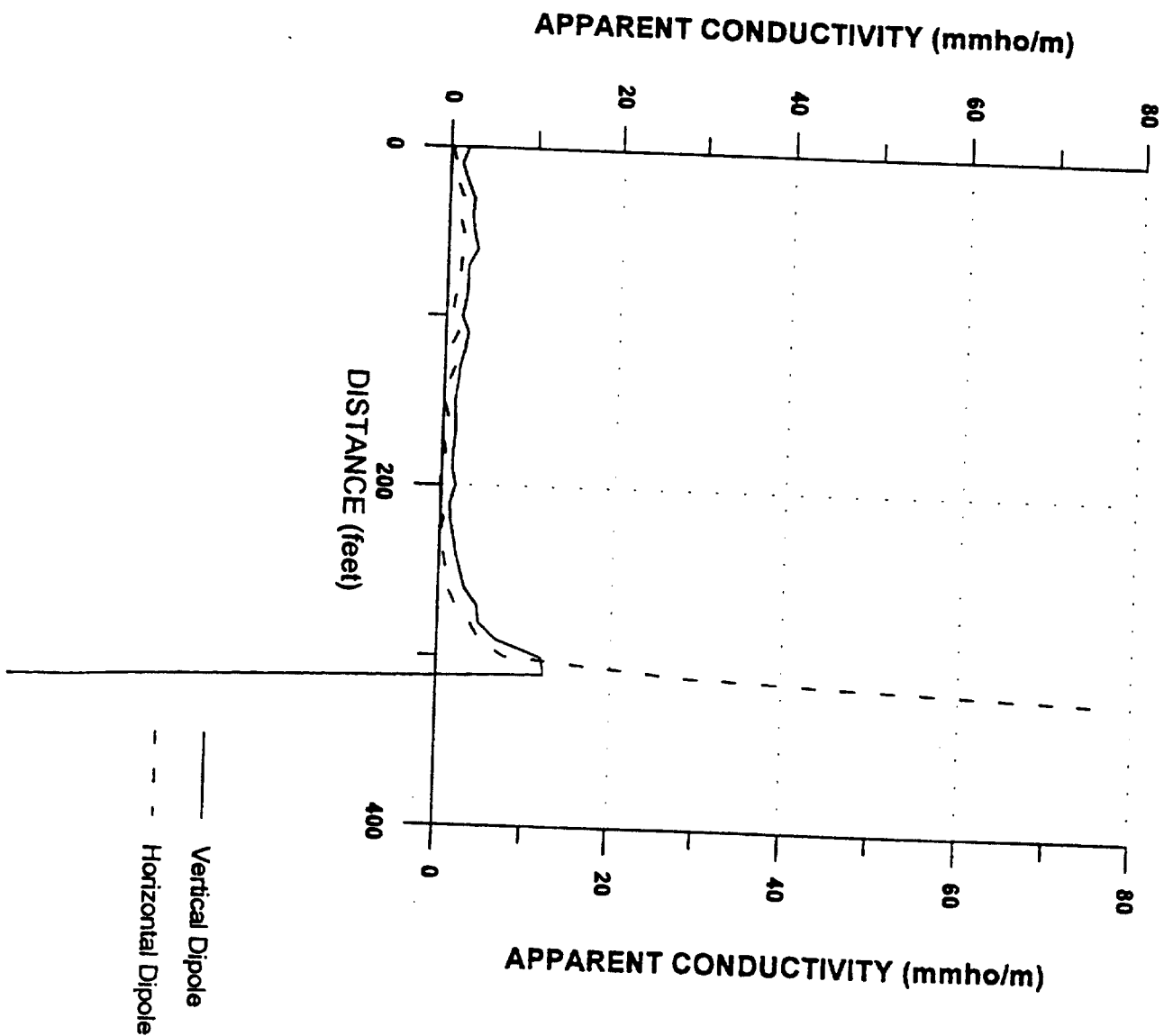
— Vertical Dipole
- - Horizontal Dipole

LINE D2



LINE E1

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LINE E1

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